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ORIGINAL ARTICLES.

SPECIFIC THERAPY OF TUBERCULOSIS AND VACCINATION AGAINST THE DISEASE.*

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I.

GENTLEMEN: Honored by your invitation I have accepted it with enthusiasm because it gives me much pleasure to speak in this great country of my studies in tuberculosis.

I come before you, a body of distinguished men, who have no fear of the new ideas that have broken the chain of old scholastic tradition in every field of human knowledge, and who bow down without reserve before the facts not caring whether or not they conform to prevailing doctrine. I shall speak to you with much confidence, because I am certain of receiving your approval.

The studies of which I am going to speak are both clinical and experimental.

I have lived for thirty-four years in public clinics and scientific laboratories, and for more than twenty years I have been the director of a great university clinic, in which tuberculosis always has been the object of my studies. I therefore have had the opportunity of acquiring a very large experience in tuberculous diseases; I have always held, however, that all clinical observation ought to be combined with assiduous laboratory research in order to illustrate and investigate the vast problems presented by tuberculosis. I accordingly established a special laboratory for the study of tuberculosis in my clinic, and afterwards founded an Institute for the study of the same. In this Institute, open to the students of every nation, a host of workers carry on experimental research under my direction. It would have been impossible without great means and a large number of able coworkers to have accomplished so much work. I might mention among these collaborators Lucatello, Marzagalli, Jemma, Mircoli, Sciallero, and Figari.

It is my conviction, moreover, that it is only by the association of clinical and laboratory work that it will be possible to solve the great problem of tuberculosis. Laboratory research alone does not accomplish the end, but it will never retard its development.

In my studies I have been inspired by two fundamental conceptions only, one relating to the cure of tuberculosis, the other to its prophylaxis. In regard to the cure, my desire has been to find out whether a specific defensive medium against tuberculous infection exists in the animal organism, or can be produced in it, and whether it is possible to utilize it for curative purposes. With reference to prophylaxis, the question was, whether or not it is possible to develop in the healthy animal organism, as is done in other infections, a special specific activity which will immunize the patient against tuberculous infection for a greater or less time.

All my researches on the question, both clinical and experimental, for more than fifteen years lead me to state: (1) *That it is possible to produce a specific therapy for tuberculosis;* (2) *that it is possible to immunize the animal organism against tuberculosis as is done in other infectious diseases, and that there is good reason to hope for an antituberculous vaccination for man.*

II.

I will now tell you at the start on what data and facts I have based my right to make these statements.

In order that I may be better understood, it is necessary for me first to set down a few fundamental ideas on the pathogenesis and pathology of tuberculosis, the result of a series of researches carried on by myself and my colleagues.

First of all I will say that the changes caused by tuberculous infection, in the tissue of an organism, and in the organism in general, are due to the poisons secreted by the bacilli when they are biologically active, and to the poisons contained in the bodies of the bacilli.

We have extracted those secretions of the bacilli known as the toxins by means of filtrations of the young cultures. We have found that they had a disturbing action upon the nervous system, especially upon that part governing the secretory mechanism and upon the nerve terminals as shown by profuse perspiration and great depression of temperature. Those contained in the bodies of the bacilli, known as proteins we have extracted with water in which they were more soluble than in any other menstruum. These have an inflammatory and destructive action on the tissues with which they come in contact, due to the necrotic acid of de Schweinitz and Dorset, and have therefore a disturbing action on the vasomotor innervation, on the trophic nerves and their terminal centers creating considerable elevation of temperature.

These poisons, extracted from the bodies of the bacilli, are the most pernicious. Injected beneath the skin they cause inflammation with purulent, fibrinous exudation, and bring about necrosis of the tissues; injected into the lungs they create foci of bronchopneumonia; when brought into con-

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tact with the meninges and peritoneum they set up inflammation. The bony tissues are also affected, presenting changes that remind one of rachitis.

In connection with these phenomena, many of which have already been seen and confirmed by other observers, it is very necessary to recognize the fact that the bacilli cause their pathogenic action in the animal organism by means of this double series of poisons, of which the proteins are the most powerful. The bacilli are of moment in that they produce these poisons and by multiplying also increase the poisons. The proteins favor their diffusion because by impoverishing the nutrition of the tissues they create a favorable soil for the productiveness of the bacilli. If one thigh of a guinea-pig be injected with bacilli and protein together, and the other thigh with bacilli alone, it will be seen that the infection travels much more rapidly on the side in which the bacilli are injected with the protein.

Another truth first proclaimed by us, and since confirmed by many other observers, is the fact that there are minor influences bearing upon the development of tuberculosis, the most noteworthy being that of the common pyogenic organisms, which favor the destruction of tissue invaded by tuberculosis and set up severe toxemic conditions.

From these new ideas light is shed upon the pathogenesis of tuberculosis. When the bacilli grow in a tissue they create there, by means of their poisons, a specific circumscribed inflammation, and form characteristic neoplasms, viz., tubercles. The nutritive changes then favor the growth of new bacilli, and thus new foci are formed progressively, and the changes in the tissue gradually become greater. If common pyogenic organisms chance to get into this tissue from the outer air (as may easily happen in the lungs) the destructive processes are aggravated and progress more rapidly.

From the bacterial foci the poisons pass into the general circulation, and set up phenomena of toxemia, which manifest fever, sweats and loss of weight. We have proof of this toxemia, because we have been able to demonstrate the presence of bacterial toxins in the urine and blood of persons having the disease.

After having gained a clear idea of the method by which tuberculous infection is developed we have turned our investigations to the discovery of the method by which the animal organism defends itself against it.

Our researches have shown that in the animal organism the elements of the tissues and the fluids possess a special defensive activity.

If we inject under the skin of such animals as the rabbit, dog, ass, horse or cow a small measured quantity of tubercle bacilli, and watch the daily changes in those bacilli, we see that little by little alterations take place in their vitality and that they are finally destroyed altogether.

If we inject directly into the lungs of a healthy animal the smallest measured quantity of tubercle bacilli we find that the bacilli undergo change and destruction without creating any lesion.

This defensive action of the tissues may not be in evidence when the number of bacilli injected is large; but it is manifest when they are few in number.

The serum of the blood of man and of other animals when in health also produces a decided effect upon tubercle bacilli.

We have studied methodically the culture of tubercle bacilli in the sera of different animals, deducing the inhibitive power of the serum by the facility with which the cultures develop in various degrees of dilution of the culture broth. It is evident that the higher the degree of dilution in which the serum exercises its action upon the development of the bacteria, the greater is its richness in antibacterial bodies.

The animals which we have studied are man, the horse, the cow, the calf, the dog, the hog, the rabbit and the guinea-pig in a condition of health.

The sera have been found to stand in this order of potency: the calf, the cow, the hog, man, the horse, the dog, the rabbit, the guinea pig. Those of the calf, the cow, the hog, man, the horse and the dog differ but slightly from one another in potency, while at a great distance from these stand those of the rabbit and guinea-pig, especially the latter, which has no action at all upon the development of the tubercle bacilli, for in its serum the bacillus develops just as well as in a common culture medium.

The serum of healthy animals, therefore, has in a definite but limited degree a defensive action against tuberculous poisons.

These defensive powers can be measured exactly by my method.

This method consists in determining by a series of graded experiments, what quantity of serum is necessary to save a guinea-pig from a mortal dose of *text-gift*. This test poison is a liquid which contains the product of tubercle bacilli macerated with heat in water, the dosage being fixed upon the basis that one cubic centimeter of the solution subcutaneously will kill a hectogram of a healthy guinea-pig.

By this method we have tested the blood of man, of the cow, the calf, the goat, the horse, the turkey-cock, the rabbit and the guinea-pig in good health.

The blood serum of the rabbit and of the guinea pig has no antitoxic power whatever, nor do the sera of other animals furnish a very great quantity. The richest in antitoxic materials is the serum of a healthy man. Then comes that of the turkey-cock, the calf, the cow, the goat and the horse.

The study of the power of agglutination carried on according to the method of Courmont-Arloing, on homogeneous cultures gives almost analogous results; none in the guinea-pig, almost none in the rabbit, sometimes an appreciable amount in other animals, especially in a strong, healthy man.

This triple power of the blood serum, bacteri-

cidal, antitoxic and agglutinating, increases considerably if a healthy animal is injected with tuberculous matter.

The bacillary poisons, the bodies of dead bacilli and living bacilli, introduced into the body of a healthy animal, produce in it antitoxins and antibodies and give it a special antitoxic, bactericidal and agglutinating property, while on the other hand they increase in it the destructive power of the tubercle bacilli in the tissue. With the methods of measuring and examining which I have invented, and of which I have already spoken, these facts may be proved exactly, and by the same methods which I have used any one who wishes to verify them for his own satisfaction may do so.

The production in healthy animals of agents of defense in the presence of tuberculous material was discovered before me by other observers in Europe, as well as in America, and among others by de Schweinitz and by Trudeau.

I took up the study of this question in 1890 in a methodical progressive manner, and I have been able to show with exactness the presence and amount of tuberculous antitoxins in the blood of animals that were under suitable treatment. I announced the fact in Bordeaux in 1895.

I use the word antitoxins in a broad sense, meaning by this name to designate all those defensive materials, taken together, which Büchner very appropriately called "Schutzkörper."

The existence of this antitoxin, at first denied, is to-day universally recognized, and constitutes as we shall see shortly the foundation for the specific therapy of tuberculosis.

The consecutive studies carried on in my school have led me step by step to prove the existence of antibodies and agglutinating substances and have enabled me to establish now, after many years' work, the doctrine of the defense of the animal organism against tuberculosis.

The healthy animal organism possesses a double series of defensive measures against tuberculosis, which may be called ordinary means of defense, and extraordinary. The ordinary means are naturally inherent in the tissues and secretions of the animal in a perfectly healthy condition, and are partly antitoxic and partly bactericidal. The extraordinary means are also antitoxic and bactericidal and develop principally in the presence of the tubercle bacilli that penetrate the tissues.

The cellular elements of the organism manufacture, as it were, substances which react against the invading bacteria and destroy and neutralize their poisons. If the organism produces defensive means in proportion to the number of invading bacteria it gains the victory. If, on the other hand, the defensive means are not sufficient, the bacteria gain ground and the organism succumbs. This happens when the bacteria growing on a tissue are very numerous, or, when not numerous, the organism is in a weak condition.

The proof of my statements may be found in the study of persons who have spontaneously recovered from tuberculosis as well as of those who have not recovered from it. In the former we find antitoxin and antibodies in large quantities in the blood; in the latter we do not find them, or only in small quantities.

Thus the vulnerability of an animal exposed to tuberculosis depends on the number of bacilli by which it is attacked and upon its reactive powers.

For this reason animals in a weakened condition are able to defend themselves if the number of invaders is small, and those that are more able to resist will succumb if the number of invading bacteria is large.

III.

These facts, gentlemen, brought up the question whether it would be possible to furnish those specific means of defense to the organism struggling against tuberculosis which are produced only a little at a time or in insufficient quantities.

Inasmuch as healthy animals inoculated with tuberculous matter produce the materials of defense found in their serum, it was but natural to seek to know whether the serum of these animals containing antitoxins and antibodies could be used as an aid to an organism struggling against tuberculosis.

From this was born, by a logical association of ideas, the suggestion of antituberculous serum therapy.

The serumtherapy which had been tried in America by de Schweintz, by Trudeau, by Stubbert and others was subjected by me to the severest scientific tests, such as are used for the serumtherapy of diphtheria and other infectious diseases.

But I would add, that it was done upon a much broader and larger basis, because in diphtheria the question was not studied as I have studied it analytically in tuberculosis, and because in diphtheria the natural defensive process of the organism was not demonstrated as I have demonstrated it against tuberculosis.

I will not trouble you with the details of the laborious course I pursued in this new phase of my studies. I will only give that which is necessary to explain my conclusions.

First of all I have established by a series of experiments what is the best method of obtaining in the healthy animal a serum rich in defensive materials which at the same time can be used in man without suspicion of danger. I have at the present time discarded the injections of living bacilli, and after numerous trials I have selected as most suitable for inoculation an aqueous extract of virulent bacilli, but dead, supplemented by the filtrate of a young culture. In this way I get the full value of the bacillary bodies and toxins.

The animals selected by me for the production of this serum were the horse, the cow, the ass, the calf, the goat, the sheep and the dog. I am convinced that the horse, the cow and the calf are to be preferred. The richness of the serum in

antitoxic materials was determined by us in the guinea-pig by means of the *text-gift*.

Our *text-gift* consists, as we have already said, of an aqueous extract of the bodies of the bacilli in an exact dosage; that is to say, so that one cubic centimeter of it would kill a healthy guinea-pig weighing a hundred grams. The potency of the serum is determined by the quantity required to save a healthy guinea-pig from a dose of the *text-gift* that has been established as deadly.

The standard of potency of the serum is established by the quantity which succeeds in saving a healthy guinea-pig of a certain weight from a deadly dose of *text-gift*.

The relative weight of the serum used to the weight of the animal saved, establishes the power of the serum. The antitoxic unit is established by a gram of serum capable of saving a gram of healthy guinea-pig. That is to say, a serum of which one gram will save a healthy guinea-pig weighing a hundred grams possesses one hundred antitoxic units, and it would need to possess one thousand units in order to be able to save a healthy guinea-pig weighing a kilogram, and so on.

The antibacterial materials, known as antibodies, have been studied by us in several ways. First we have added the serum in various amounts to a culture of tubercle bacilli, as we have already indicated, and thus have found how much it takes to prevent development. Next we have kept virulent bacilli immersed in the serum so that we might see whether they could still be cultivated, and were capable of giving tuberculosis to animals upon inoculation. Then we have injected virulent bacilli combined with the serum, and have seen to what degree they would render the guinea-pig and rabbit tuberculous.

The measure of the agglutinating power completes this research, and gives us the method of measuring the antibodies which are in the serum.

When the horse, the cow or the calf, under proper treatment, attains the power of giving a serum which has *at least* a thousand antitoxic units per cubic centimeter, and shows upon every test a bactericidal power, and which has reached an agglutinating power of at least one to three hundred, such serum may be used for therapeutic purposes, because it contains a sufficient quantity of antitoxin and antibodies.

When in Bordeaux in 1895 I said it was possible to obtain a serum rich in defensive antituberculous substances, chiefly antitoxin, everyone doubted it. To-day, all the laboratories, beginning with those of Behring and Koch, admit that it is possible to have a serum with specific antitoxic substances and specific antibodies.

The richness in antitoxic substances or in antibodies varies according to the method of treating the producing animal. If the animal is treated simply with toxins it is rich in antitoxin, and poor in antibodies. If it is treated with the bodies of dead bacilli, or an extract of the same, it is rich in antibodies, and poor in antitoxins. Recently we have succeeded in producing sera with an agglutinating power of 1-2,000 and even more, which have in addition a thousand antitoxic units to the cubic centimeter. I have tried to determine whether this serum would be innocuous to tuberculous animals and tuberculous men by injections into healthy animals and men. I am convinced that it is innocuous.

I have wished to see what would happen in the organism of healthy animals and healthy human beings into whom this serum has been injected. I have found by means of my method of grading the dose that with its use there has been a marked increase in the quantity of antituberculous substances which are found in the circulation.

Inasmuch as I found that according to this method of measuring the antitoxic and antibacterial powers of sera, there was an increase of defensive substances in the blood of the injected animals greater than the geometrical proportion I am obliged to conclude that the organism plays an active part in this tremendous increase. And inasmuch also upon the injection of the same serum in subjects that were very sick this increase did not take place, I am convinced that the participation of the organism is necessary to this increase.

I have wished, in short, to see what would happen in the organism of a tuberculous man in whom this serum was injected, and I have found the following: If there were no defensive substances in the blood before its use they appeared afterward. If, however, they had been there before, they were markedly increased afterward. I saw also that by means of its use toxic symptoms disappeared or were diminished. The progress of local inflammation was modified and caused to disappear.

In consequence of this action we observe in a general way diminution and disappearance of fever; diminution and disappearance of sweats; progressive improvement of the nutrition resulting in considerable increase in body weight.

And then, from a local point of view: The disappearance of the foci of bronchopneumonia, the production of foci of connective tissue, so as to form a sclerosis at those points which are involved by the disease; diminution and disappearance of the cough and expectoration; and finally, the disappearance of the bacilli, all of which are clinical signs of cure.

All these results *do not follow* in all cases of tuberculosis, but they do follow in nearly all cases of tuberculosis in the beginning of the disease. They do not follow when the general nutrition is profoundly impaired; they do not follow when there are centers of mixed infection with extensive destruction of tissue. They do not follow, in short, when tuberculosis has become phthisis.

I hold strongly to this differentiation between tuberculosis and phthisis, meaning by phthisis that morbid state in which the lungs by the combined action of tuberculous infection and pyogenic infections are the seat of destructive lesions, while the organism as a whole is profoundly affected.

in its nutrition by the result of combined toxemiæ; namely, tuberculous toxemia, streptococcus toxemia, staphylococcus toxemia and even others.

When I announced these therapeutic results in Bordeaux in 1895 they were received with doubt. So deeply rooted in medicine is the conviction of the incurability of tuberculosis that any announcement of a new method of treatment awakens incredulity. But the use of antituberculous serum therapy has become spread abroad. In Italy as well as in other countries the serum prepared by my method has been used in large quantities. In these nine years there have been at least 20,000 cases of tuberculosis treated by my method. Naturally it is impossible for me to have data of all these cases. I have only been able to collect the notes of 2,899 cases. These were collected in a statistical communication by one of my most valued coworkers, Prof. Mircoli, to the Congress of Tuberculosis in Naples. These statistics show that out of more than 250 cases of circumscribed non-febrile tuberculosis 38 per cent. were cured and 49 per cent. were much improved; that out of 938 cases of circumscribed febrile tuberculosis, 18 per cent. were cured and 54 per cent. were improved; that out of 665 cases of diffuse tuberculous bronchopneumonia without microbic associations 14 per cent. were cured and 43 per cent. were improved.

Out of 332 cases of diffuse tuberculous bronchopneumonia with associated microbic infection 9 per cent. were cured and 36 per cent. improved. Of 712 cases with cavities and lesions 6 per cent. were cured and 40 per cent. were improved. Of all these patients 2,396 were in a febrile condition. The fever disappeared in 1,111 cases, that is, in 46 per cent.

As regards my personal experience, I can say that I have seen the most assuring results, and that the cures have persisted in those patients whom I have been able to follow. I have some that have survived seven and even nine years. I have seen the best results in ambulatory patients, but I also have had pretty good results in inmates of my clinic. In the hospital only those invalids come for treatment who are in a bad condition, and who are not at all in the same class as the ambulatory patients, for they are phthisical as well as tuberculous.

In this connection, it must not be forgotten that if the serumtherapy is to succeed there must be cooperation in the organism of the sick person, and if this organism is not in condition to keep up active cooperation, the treatment will be futile.

In your country, also, antituberculous serumtherapy has shown remarkable results from what I have been able to gather from a communication made by Prof. de Schweinitz, of Washington, to the International Congress of Tuberculosis in Berlin.

I believe that if one asked of serumtherapy only what could reasonably be demanded of the therapy of any disease, confidence in it would increase, with great benefit to mankind. I say this because physicians demand in tuberculosis what they would not dare to ask for in other diseases, or of those remedies which are best known and surest in their action.

No physician, for example, pretends that a heart with myocardiac degeneration ought always to maintain its functions; and he does not lose faith in the efficiency of digitalis, if the digitalis does not succeed in restoring activity to such a heart. No physician pretends that a liver violently affected, severely impaired in its nutrition by malaria, should return to its normal state by means of quinine, nor does he lose faith in quinine when he does not succeed.

The same may be said of mercury when the tissues are already destroyed, or deeply affected in their nutrition by the effect of syphilis. Would one, perchance, lose faith in corrosive sublimate if he should not cure by means of it a case of tabes dorsalis of syphilitic origin?

In tuberculosis, however, everything is expected always and in every case. And, furthermore, a remedy is wanted, not only to combat tuberculosis, but to build up an organism already destroyed by tuberculous infection. These are the unreasonable claims that will never be satisfied by any remedy, and which until now have prevented physicians from properly appreciating the various proposed treatments for tuberculosis.

While on this point, permit me to put you on your guard against another error which is, unfortunately, widespread. It is this: Don't judge a treatment for human tuberculosis by experiments in the cure of guinea-pigs which have been given an artificial tuberculosis.

It will be seen as our knowledge concerning tuberculosis and serumtherapy increases that this hypothesis has been wrong.

It is wrong, because the tubercle bacillus develops different properties in the various organic soils, and above all in various animals; wrong because the serumtherapy is effective only through the active cooperation of the organism to which it is applied. Not only this, but there is also a great difference in the manner in which infection takes place between the guinea-pig and man, because in man we do not find the system struggling with such an enormous quantity of virulent bacilli injected at one time, as we do when a guinea-pig is artificially injected.

The efficacy of antituberculous treatment, therefore, should be judged exclusively by clinical observations, and I can now assure you with full conviction that clinical observation is very favorable to serumtherapy, and at the same time that serumtherapy has a broad and sure scientific basis, because it has been proved that the serum contains antitoxin; that the serum contains antibodies; that the introduction of the serum into the organism produces new antitoxins and new antibodies.

For the rest, serumtherapy does nothing more than reproduce the process followed by nature in spontaneous cure, adding its good effects to those of hygiene, given to the organism in sanatoria, because serumtherapy, hygiene, and sana-

toria all have the power of endowing the organism with the necessary energy to struggle successfully against tuberculosis.

I am convinced that in a few years, when physicians will have learned all the benefits that serumtherapy can give in tuberculosis, it will be remembered with regret that so many lives might have been saved, and were not, because physicians with preconceived doctrines put it aside, and gave preference to remedies which were sanctioned neither by science nor by practice.

IV.

In the beginning of my treatise I said that it was possible to immunize the animal organism against tuberculosis, as is done in the case of other infectious diseases. These results of my studies and experiments I announced at Bordeaux in 1895. At that time my statement seemed like heresy. To-day, on every side it is affirmed that it is possible to immunize animals against tuberculosis, so as to render them able to withstand, as I put it nine years ago, injection into the veins of a virulent culture of human tubercle bacilli. The methods used by me and by various other experimenters differ; the result, however, is the same, *viz.*, resistance to tuberculous infection.

Permit me now to leave all that which pertains to the historical side of the question, in order to enter at once upon the practical and essential part of the argument.

The positive proof that immunization has taken place consists in showing that the animal has become able to withstand the endovenous injections of a virulent culture of tubercle bacilli. But this proof should be kept within proper limits. Those who believe that they have proof of having attained immunization which will permit of endovenous injections of colossal unlimited quantities of a culture of living, virulent bacilli, are in error, because when a quantity of powerful bacilli has been injected, the animals frequently die quickly from severe toxemia, due to the poisons of the injected bacilli; they also err even when this does not happen, because the defensive means of the organism are not in proportion to the number of invading bacteria, and the animal becomes tuberculous.

The school of Koch likewise holds this view, and it is necessary to conform to it to avoid exaggerations which have made observers of the truth withdraw from us and which still keeps them at a distance.

It is necessary to have an exact standard, and it should be borne in mind that normally infection never occurs in man in the manner above described and with such violence; it also should be borne in mind that we ought to study the problem in its clinical aspects, and from the point of view of its applicability to bedside treatment. We should be satisfied with a limit, and the limit is indicated by the quantitiy of bacilli that is sufficient to develop in control animals a slowly progressive tuberculosis. If in immune animals this quantity becomes innocuous we should feel that we have attained our object.

It is important, therefore, to recognize and study the modifications which take place in the organism of animals just rendered immune in in this way.

This is what happens. Their tissues acquire the power of rapidly destroying the tubercle bacilli that have been thrown into them.

Thus by injecting virulent bacilli, according to the method which we have already given, under the skin of rabbits and asses that have been rendered immune, we find that the bacilli are destroyed more rapidly than in the tissues of the control animals that had not been immunized.

The blood serum of these animals acquires a special bactericidal property toward the bacilli of tuberculosis; that is, one which hinders the development of the culture, causes necrobiosis of the tubercle bacilli and renders inert the tubercle bacilli that have been injected into them along with the control animals. The blood serum acquires special antitoxic properties toward the tuberculous poisons and protects guinea-pigs from a deadly dose of the same. It also acquires agglutinating power. All these changes are indications of attained immunization.

Koch, and his school, attach great importance to agglutination which they depend upon as the sign of the advent of immunization. I recognize its importance as it runs parallel to the development of the bactericidal properties of the serum. But I hold that the demonstration of the existence of this property is even more convincing.

Out of it all stands forth the fact that we have a direct method of showing attained immunization, and, thanks to the proof of the resistance of the animal to the bacilli injected into the veins, an indirect method of showing the value of the defensive substances produced in immunized animals.

In animals, immunization may be obtained with different procedures, and may be either active or passive as is the case in any other infection.

The method most commonly followed for the production of active immunization against tuberculosis in animals is that of progressive injections of bacteria of variously attenuated virulence. This method has given good results and has been as successful in my school as in that of Behring and of Koch. It is, however, a method that is difficult to carry out because one does not always hit the exact dosage, and then the animal is lost or immunization does not take place. And for this reason it has not succeeded and does not succeed in the hands of many observers.

A more certain method of active immunization is that of inoculation with dead bodies of the bacilli properly prepared, sometimes used whole, and sometimes macerated in warm water. With this procedure good results have been obtained, and long experience has shown that the injection

of very little material is required for the production of a large amount of defensive material in the animal organism.

Another method of active immunization which has been recently used by us, and which has given the best results, is that based upon the use of what we call bacillary pulp. This bacillary pulp consists of the juice of very virulent bacilli which we obtain by expression and subsequent passage through the Chamberland filter.

We thus have a juice which in all the tests made is shown to be absolutely free from bacilli, a juice of bacilli which has been in no way changed by chemical agents or by heat. This juice produces satisfactory immunization, causes the formation of defensive substances in large quantities, especially of antibodies, and can be easily standardized. It has all the characteristics of living bacteria without any of the disadvantages. And considering the fact that the bacilli act only through their toxins it is easy to see how it can be reasonably substituted for the bacilli. But, setting aside all doctrinal considerations the fact stands out that immunization by this means progresses rapidly and with safety. By this method we have also been able to immunize guinea-pigs and rabbits, and have obtained in guinea-pigs sera with an agglutinating power of from 1 to 1000, and in rabbits from 1 to 2000.

Passive immunization may be obtained for tuberculosis as it is for other infections, by introducing into the animals under experiment, defensive substances, antibodies, and antitoxins, obtained by proper treatment from another animal.

In reality this immunization is not wholly passive. It arises, without doubt, in the animal organism through the energies of the organism itself; this is proven by the fact, as I have shown, and as may be found by any one who proceeds according to my method, that the antibodies and antitoxins exist in the blood of animals thus injected in much larger quantities than was injected. Guinea-pigs and rabbits thus treated attain the power of withstanding endovenous injections of a quantity of virulent culture that surely would kill the control animals in four or five weeks.

Introduction of these materials is made by injection of the serum containing them subcutaneously and intravenously and may be accomplished through the digestive tract. This latter is a part of our more recent studies which deserves further investigation, on account of the importance that it may have in human practice, and on account of the immediate possibility of its application to man.

The passage into the blood of materials for defense against bacterial infection, by way of the digestive tract, has been hardly studied at all until now, and it opens up an entirely new and almost unexplored field of research. The most conclusive studies are all Italian. There are those of Prof. Sclavo, who has demonstrated the possibility of introducing diphtheritic antitoxins by the digestive tract and of developing their immunizing action in animals, and those of my school in respect to the absorption by the digestive tract of antitoxin and tuberculous antibodies.

I shall set aside all doctrinal questions to which this might refer, convinced, as you will be, that the facts are worth more than all the discussions, and I will tell you what I have seen.

The first idea of resorting to the digestive tract for the introduction of antitoxins and tubercular antibodies came to me when confronted with some patients who opposed the injection of serum.

The results impressed me because I saw antituberculous substances increase in their blood at the same time that I observed develop in them analogous effects to those which I had seen with serum injections.

Struck by this fact, which I made public in 1898, researches in connection with it were undertaken in my laboratory. A first series of examinations showed that not only the serum of the blood but above all the blood clot, that is, the conglomeration of red and white blood corpuscles, contained the immunizing substances in large quantities. The next step was as follows: there was drawn from the jugular veins of an immunized animal (horse, cow) a certain amount of blood. Part of this was allowed to coagulate in a sterile vessel, in order to gather the separated serum. Another part was rapidly defibrinated, and the serum was collected in a few minutes by centrifugalization. The sediment was then repeatedly washed with a physiological salt solution, and an extract prepared using an amount of distilled water, equal to the serum extract. After forty-eight hours the agglutinating power of the three preparations was estimated in comparison with homogeneous cultures of tubercle bacilli (method of Courmont and Arloing), and the antitoxic power in comparison with the *text-gift*.

If the antitoxin and the agglutinating power were free in the circulating plasma, the agglutinating and antitoxic power of the serum of centrifugalization ought to be equal to that of the separated serum, and there ought to be little or no agglutinating and antitoxic power in the aqueous extract of the corpuscles.

However, in all the trials of centrifugalization, the serum which had stood the least time outside of the organism in contact with the cellular part of the blood was shown to possess a markedly inferior agglutinating power to that of the separated serum (the serum remained for a long time, forty-eight hours in contact with the cellular part of the blood) obtained by the coagulation of the blood of the same animal.

The aqueous extract of the corpuscles always has had an agglutinating power distinctly superior to that of the serum of centrifugalization in the same animal; and equal, and sometimes superior to the agglutinating power of the separated serum of the same animal.

To sum up, so far as the agglutinin is concerned, the lower the power in the serum of centrifugalization, the higher is it in the extract of the corpuscles; and while there is a marked difference between agglutinin contents of the serum

of centrifugalization and the separated serum, there is little difference between the separated serum and the extract of the coagula, although this latter has been shown to be always perceptibly richer.

So far as antitoxic value is concerned the extract of the coagula and the separated serum always show themselves endowed with a high value, equal to 1,000 antitoxic units; that is to say, capable of saving as much the one as the other when injected under the skin in the proportion of one to one thousand of weight, the healthy guinea-pig having been given a mortal dose of tuberculin, while, on the other hand, for the centrifugalized serum it was necessary to save a healthy guinea-pig from the same mortal dose of *text-gift* to inject in one instance in the proportion of two thousand, and in three other cases in the proportion of one to five thousand, that is to say, showing it possessed from 500 to 200 U. A.

The results obtained lead us to believe that the tuberculous antitoxins and agglutinins although found circulating freely in the plasma, are only found in very small quantities, and that therefore they must hold a more or less intimate relationship to the figured elements of the blood. And as it appears that the faculty of producing these substances cannot be attributed to the red corpuscles of the blood; on account of their specific physiological function we must hold that it belongs to the leucocytes of the blood.

In pursuit of this knowledge we have methodically fed guinea-pigs, rabbits, dogs and asses with this substance. To a series of guinea-pigs we gave daily by the digestive tract three grams of this tuberculous antitoxin for about one hundred days. Before the experiment, having bled from the carotid, we measured the agglutinating power and found it wholly negative; after fifty days of treatment the sera of these guinea-pigs had agglutinating powers that ranged from a minimum of 1:15 to a maximum of 1:30. After one hundred days of treatment the sera of these guinea-pigs presented an agglutinating power of 1:25, 1:40, and finally, 1:50. These guinea-pigs were divided into two series. In the first series we injected into the veins living virulent bacilli in the proportion of 2 milligrams to each animal. In the other series we injected a deadly dose of test poison.

Of the guinea-pigs injected with living bacilli in the veins, some lived sixty, some ninety days, while an equal number of control guinea-pigs of the same weight injected in the veins with the same dose of the same bacilli all died within twenty-five days with marked emaciation. At the autopsy of the former there was found circumscribed pulmonary tuberculosis, and tuberculosis of the lymphatic glands, while in the controls there was most acute diffuse tuberculosis. In the second series with subcutaneous injection of test poison in the dose of 1:100, all triumphed victoriously over the poison; while an equal number of control guinea-pigs injected with the same quantity of the same tuberculin all died in from three to five days.

To a series of rabbits there were fed daily four grams of antitoxin; all these rabbits before the experiment showed neither antitoxic nor agglutinating powers in their sera. They were subjected to this treatment for about sixty days. At the end of that time the agglutinating power of their sera was from 1:50, and in some from 1:60, the antitoxic power was equal to 330 antotoxic units; this serum injected in a dose of 5:100 subcutaneously in a healthy guinea-pig saved it from a deadly dose of test poison. The rabbits thus immunized, together with the same number of control rabbits, each received in the marginal vein of the ear five centigrams of living and virulent tubercle bacilli.

The controls all died in eighteen to twenty-five days with marked emaciation (some had lost more than a third of their weight) and the autopsy showed diffuse miliary tuberculosis in the liver and lungs.

The rabbits previously subjected to the treatment with antitoxin by way of the stomach, easily overcame the injection of living bacilli. At first they lost weight and then they gained, and when they were killed about three months later they were in a general condition of robust health, and at the autopsy there was no sign of tuberculosis.

Also in a series of dogs immunization was practised against tuberculosis, by way of the stomach. To these dogs were given daily mixed with their food five grams each of antitoxin. The dogs thus treated developed in their sera conspicuous agglutinating and antitoxic properties. Before the commencement of the treatment each dog was tested for the agglutinating and antitoxic power of its serum by bleeding from the carotid. In not one, notwithstanding repeated experiments, was any antitoxic property found in the sera, at least in any degree that was appreciable by the methods employed. Besides it may be said that the agglutinating power of the serum of the majority of dogs has been found negative; although some have shown a very small agglutinating power equal to 1:5 and the highest to 1:10.

The duration of treatment was about three months; after two months, on bleeding these dogs and measuring with the Courmont-Arloing method the serum was found to have agglutinating powers, ranging from 1:50 to 1:100 and antitoxic value equal to 200 antitoxic units.

At the end of this treatment, that is, after the dogs had taken antitoxin by the stomach for three months, the agglutinating and antitoxic power of their serum was again tested, and it was found that it had been much augmented, amounting in all the dogs to a value of 1:200 and even more.

The increase of agglutinating power was accompanied step by step by antitoxic power. The sera of all these dogs had attained so high an antitoxic value that injection of a dose of two per cent. under the skin of healthy guinea-pigs saved them from test poison; these sera had obtained an antitoxic value equal to 500 units.

It was likewise found with the dogs that their organisms presented resistance to bacillary infection, after their sera, as in the rabbits and guinea-pigs, had shown the presence of a conspicuous amount of antitoxic and agglutinating substances.

In these dogs, and in the others under control, all of about the same weight, there was injected into the vein of the foot 30 centigrams of living virulent bacilli in an emulsion of physiological serum.

Some days after the injections all the dogs began to show emaciation, quite marked in those that were not immune, but less notable in those that were immune, and these latter, after a period of about twenty days of general ill-health, recovered completely and all gained weight perceptibly. At the point of injection there was no reaction whatever, and after fifteen days one could not, upon inspection, see the point on the vein in which the needle was introduced.

But quite different, on the other hand, were the fortunes of the control dogs; at first inflammatory processes were noted, and then ulcerations at the point of injection, with necrosis and conspicuous loss of tissue; these ulcers continually presented a superficial torpid granulating surface which never healed, notwithstanding proper local applications.

In the dogs of this series (the controls) the emaciation, marked from the beginning, continued progressively and in a state of marasmus reached during a period of from 40 to 60 days a marked loss according to the body weight; in some the loss amounting to almost half the original body weight.

At the autopsy there were found active tuberculous processes at the point of injection, tuberculosis of the neighboring ganglia, of the mesentery, liver, spleen, and to a slight degree of the lungs. None of the immunized dogs, which gradually, one by one, were killed after a period of from two to four months, showed any signs of tuberculosis.

In the asses to which were fed daily twenty-five grams of antitoxin by the stomach a considerable increase of agglutinating and antitoxic power of their sera ensued. In them it was observed that ingestion of this substance produced decided well-being and a noticeable increase in weight. Their sera, examined at intervals, presented a conspicuous development of agglutinating and antitoxic substances. Before beginning the treatment each was accurately tested, for antitoxic and agglutinating power of their serum, by the methods indicated, and in no case was agglutinin and specific antitoxin found to be present.

In the first experiment made, about fifty days after the beginning of the treatment, we found agglutinating powers in the serum, ranging from a minimum of 1:50 to a maximum of 1:150, and antitoxic powers varying from 100 to 200 antitoxic units. After four months all the asses were bled again, and we found in their sera decided presence of agglutinating and antitoxic substances. They possessed agglutinating powers which amounted to about 1:200, and antitoxic powers equal to 500 antitoxic units.

The experiments here related are therefore positive proof that defensive antituberculous materials are absorbed by the digestive tract, and that they confer upon the animals to which they have been fed a resistance against tuberculosis. And they are absorbed independently of the age of the animals.

In like manner the milk of cows which have been immunized against tuberculosis contains defensive materials, and when administered by way of the digestive tract, confers upon the animals nourished by it immunizing properties.

The question of the passage of immunizing materials against infection in general into the milk is one that has come to be much discussed of late, more on the score of reasonableness than as a positive fact. Here, as in the beginning, setting aside all doctrinal debates, I will only say that so far as antituberculous defensive materials are concerned, they positively do pass into the milk, and I make the statement as the result of our investigations.

We have in fact immunized two milch cows with the juice of dead macerated bacilli, according to the methods we have habitually followed, studying during the time their milk, both as to its agglutinating power on a homogeneous culture of tuberculosis and its antitoxic power over *text-gift*.

Step by step, as we proceeded in the immunization we saw appear in the serum of their milk, when properly prepared, agglutinating powers which developed progressively, increasing in a parallel line with that of the serum of the blood, and maintaining approximately a relation of 1 to 5; that is, the agglutinating value of the serum of the milk was a fifth less than the agglutinating value of the serum of the blood.

We likewise have been able to establish the presence of agglutinin in the milk of the immune female rabbit, and relatively to that in the blood, in a measure in even greater quantity than in the milk of the cow.

It is certain that the antitoxins pass into the milk, and agglutinin in greater proportions than the rest. The proportion between the antitoxin contained in the milk and that contained in the blood we have found to be as 5 to 10.

All of these proofs were made according to the methods we have already spoken of, and there is no doubt whatever concerning this fact, namely, that the antibodies and bacillary antitoxins contained in the blood of immunized females pass into their milk.

If, then, we feed sterile animals with this milk, we find, as we would expect after the experiments we have just described, that the defensive material becomes absorbed in the digestive tract and passes into the circulation.

We have fed eight-day-old calves for four months with milk from an immunized cow, the serum of whose milk had an agglutinating power of 1 to 40, and an antitoxic power of 1 to 700.

The blood of these calves before they were fed on the milk had neither antitoxic nor agglutinating powers. However, the serum of the blood of these calves after having used for four months the milk of immunized cows, acquired an agglutinating power of 1 to 70 and an antitoxic power equivalent to 1,000 antitoxic units to the cubic centimeter.

Behring in a conference held a year ago in Vienna, inquired whether antituberculous materials pass into the milk, and whether they can be absorbed by the digestive tract.

Our first answer to this question was given even before he had asked it, because our communication was made in 1902 to the Congress of International Medicine in Rome. These later studies which I now report, give the answer in full.

Further research will better define the qualifications of the fact, but the fact itself stands, and has an importance from which there is no escape.

It therefore enables me to affirm that immunizing materials can also be introduced into the animal organism by means of the gastro-enteric canal, and be utilized for passive immunization.

As we have seen, the ways in which immunization can be attained are numerous, no special bacilli nor obscure processes being necessary as there would appear to be on reading what Behring has said in his address. It is only necessary to employ good products and to acquire that experience which comes to those who work constantly at a given subject.

In view of the now indisputable fact of the possibility of immunizing animals against tuberculosis it is natural to ask why can we not obtain the same results in man, and create thus in his body a certain resistance to tuberculous infection. It is this problem that engrosses me at the present time, and has absorbed all my energies.

I have examined every possible means of immunization adopted for animals. I have discarded active immunization by means of endovenous injections of attenuated living bacilli. This is a procedure which we will never be able to adopt in practice. Though it is true that Möller, the director of the sanitarium at Belzig, near Berlin, has tried endovenous injections of the bacilli of tuberculosis which had been attenuated in the body of the crocodile, and has had no bad results from them, nevertheless, in spite of his example, I repeat, this method of immunization will never enter into human practise. I could never advise it. Inasmuch as my studies have clearly shown that the action of the bacilli depends upon the toxic substances contained in their protoplasm, and in the toxins secreted by them; and since it is possible to produce antitoxin and antibodies by means of injections of these materials only, I neither see nor comprehend the necessity of injecting living cultures, no matter how much attenuated. We must not forget that the resistance of the tissues to tubercle bacilli varies with each person, and what might happen in such a case might be, as has been seen in animals by many experimenters, the production of a tuberculosis as the result of an injection of active bacilli, intended for immunization.

Passive immunization by introducing into the human body immunizing substances prepared in the body of healthy animals by the methods which I have already indicated, is the method which certainly seems the most easily attained for man.

By injections of sera rich in antitoxin it is possible to confer upon the human body a very high degree of immunization, both through the substances introduced and through those which the substances introduced provoke the production of in the human body itself.

If we measure the antitoxic, antibacterial and agglutinating powers of the blood serum of a man after a period of injections into his blood serum from an immunized animal, we find that we have raised the standard very high. The antitoxic power may reach and even surpass 1,000 antitoxic units per cubic centimeter, while the agglutinating power reaches the figure of 80 to 100.

These facts prove that immunization has taken place, and show that the same thing happens in man as in animals when treated in the same manner, the latter thus becoming refractory to the endovenous injections of virulent tubercle bacilli which kill control animals.

In man, we have never made this test and will never make it. The analogy to what happens in animals is, however, a sufficient proof of it.

In addition, we have a proof in men suffering with tuberculosis, and who have been healed by injections of therapeutic serum, that is quite analogous.

In these subjects, who in consequence of such injections given have been permanently cured, the serum by developing a therapeutic action has evidently also caused immunization, because without this they would have had a reinfection in an organic soil which had lost its defensive powers or the capacity to produce one. And, this is a fact to which until now sufficient attention has not been given, and which therefore deserves to be considered.

In view of the wide diffusion of tubercle bacilli it must be held that if a subject cured of tuberculosis does not become reinfected, it signifies that his organic soil has become modified in such a way as to be able to withstand a new infection. If this were not true, he would again become infected.

Now, of these subjects who have been injected there are many who have been permanently cured for ten years, and a number of them are from time to time under observation in my clinic. In this connection it would be interesting to tell the story of a tuberculous family observed in my polyclinical service. In this family the mother had had a brother and two sisters who had died of tuberculosis. She, however, was well. The father was born of healthy parents. From this marriage 12 children were born. One died of diphtheria at

three years of age, the other 11 were all tuberculous. Of these, four had already died before the family came under my observation. The other seven all came to my polyclinic, and all showed pulmonary tuberculosis in different stages. They were immediately subjected to passive immunization with progressive injections of antitoxin; to-day they are all in excellent condition, showing nothing wrong in the respiratory tract. The immunization has lasted for three years, during which time the patients have worked and lived in miserable hygienic conditions. They went to work and were exposed to all sorts of weather. This is a significant illustration, on account of the number of the individuals and the family to which they belong.

Indeed analogous results may be obtained in man by the introduction of defensive materials by way of the digestive tract, with serum, with blood coagula, with milk, and most probably with the flesh of immunized animals.

In the test subjects to which we have administered antitoxin and antibodies by the mouth, we have seen the agglutinating power mount from zero to fifty, and the antitoxic unit from an insignificant fraction per cubic centimeter to 200.

This shows that also in man agglutinin and antitoxin administered by way of the stomach pass into the circulation and stimulate the formation of other agglutinins. The same thing happens, therefore, in man that happens in animals which, as we have already seen under the same treatment, become refractory to endovenous injections of virulent bacilli.

Behring, in the past year, after having finally discovered what I had discovered nine years before, namely, the presence of antitoxin and antibodies in the blood of immunized animals, expressed the hope that such substances might possibly be used in milk for human prophylaxis. He expressed simply a hope because, as he announced, he then had not had any actual experience in the matter. This hope, as a result of our studies that have already been published, had been realized before he had even expressed it. Our investigations show that it is quite possible to get a certain degree of immunization by means of the digestive tract in adults; this point is emphasized because Behring held that it might be hoped for only in infants.

Another method of possible immunization in man which I have studied and which is also efficacious, is a method of mixed immunization, first passive, then active, which we call progressive immunization.

The following is the method by which I proceed: I give first of all a series of injections of a cubic centimeter of serum rich in antitoxin and antibodies for a period of twenty days on alternate days. Then, during the second period, I inject the same serum added to an extract of macerated tubercle bacilli in a progressively increasing quantity. I begin by making five injections with serum that contains a milligram of extract to the cubic centimeter, and thereafter consecutively five injections with two milligrams, five with three milligrams, five with four milligrams and five with five milligrams, always using one to each cubic centimeter.

Following this comes a third period in which I inject the extract of bacilli in aqueous solution by itself and in a progressively increasing dose; that is, five injections to a milligram per cubic centimeter, five to two, five to three, five to four, five to five.

In this manner, after a period varying from three to four months, there develops in the blood of man a considerable quantity of antitoxins, bactericidal materials and agglutinating materials. Men in whom there had been an agglutinating power of from one to five reached the point of having an agglutinating power of from 1 to 100, which to any one who has had experience in such studies, is a rather high power of agglutination. Naturally, in these men I did not make any injection of living bacilli to see by direct test whether immunization had actually taken place, but I can only say that animals treated in the same manner and with the same strength proved resistant to injections of a culture of living bacilli. The animals also had antitoxic, bactericidal and agglutinating materials in the blood.

I have lately studied a method for man that is very promising and easy of attainment. I was led to this by what I had observed in my studies of the efficacy of the dead bodies of the bacilli in the production of immunity; and I took as a keynote this fundamental principle: *Create a peripheral focus of tuberculous inflammation without living tubercle bacilli and bring about by this means the active production of defensive materials. In this way a true vaccination may be practised.*

I have adopted such a method in man, after having controlled it in animals. In the animals treated in this manner, I had the usual results; that is, resistance to the culture of living bacilli, the production of defensive materials, and a high agglutinating power. In man I have observed analogous results, with the exception of the resistance to living bacilli which I have not proven. I will tell you in detail what happens. The part used for the injection is the same as in Jennerian vaccination, the arm. A superficial subcutaneous injection, but exceedingly superficial, is made in the arm with a small quantity of vaccine material. A fever develops. Let me illustrate by some cases: Two children habitually feverish have had these injections. One of them on the day following the injection had an elevation of temperature which reached 100.7° F., with a corresponding acceleration of the pulse. The day after there was again a slight elevation. The fourth day after, the temperature again went up, then the thermic curve ended in a complete fall. No other phenomena of general disturbance occurred outside of that of a slight feverishness. In the other child, on the day following the injections the fever reached 101.9° F. and

lasted two days and then fell. The course of the pulse also followed the thermic curve. The same thing happened in several other infants which I injected in this way. There is a local formation of a small abscess which is limited and completely sterile. There results a small purulent focus which if the injection is even slightly deep requires some time to heal. We have had some that lasted three or four months before they were completely healed. In the meantime there is a progressive increase of agglutinating power. For example, a child that had an injection on March 1, 1903, with an agglutinating power of from 1 to 10, had already reached on April 10 an agglutinating power of 1 to 20, June 15 of 1 to 25, July 20 of 1 to 60, and October 15 of 1 to 100. The most important feature of this is the progressive increase, because it shows that defensive substances are being continuously elaborated. The interpretation placed upon it may or may not be true, but the fact is that the increase of agglutinating power is progressive, and has been so in the whole series of subjects that I have injected. I cannot ascertain whether or not these children are now capable of resisting an injection of virulent tubercle bacilli, because I have not wished to make such a test upon them, but I have the most important criterion of analogy. The animals thus treated and which have presented the same phenomena, the increase of agglutinating and antitoxic power and bactericidal power, were able to withstand endovenous injections of a virulent tuberculous culture. In addition the human clinic furnishes us data which confirm these experimental facts.

We often see that when a focus of tuberculosis is completely healed in man he remains permanently immune against tuberculosis. There are cases of surgical tuberculosis which quite clearly establish this fact, since, as a rule, when they are cured, tuberculous foci do not again show themselves elsewhere. And in families in which tuberculosis is prevalent we see that the only ones that survive the other members are those who have articular tuberculosis and have been cured of it. In subjects that have had cutaneous tuberculosis the same thing usually occurs. There have also been similar examples in visceral tuberculosis.

There are many cases of peritoneal, pleural and pulmonary tuberculosis cured in patients who have never afterward had any tuberculous foci in any part.

When an individual is completely and surely cured of a focus of pulmonary tuberculosis and sclerosis of the area previously affected has taken place, we see that he remains habitually and permanently immune. I say completely and surely cured because there is no need to confound with cure that improvement of the general condition that is due to the neutralization of the tuberculous toxins while locally the lesions persist and continue.

These cases are so many more examples of what the casuistic clinic furnishes us in subjects immunized against tuberculosis by having had an attack of curable tuberculosis, and having been cured of it.

I say immune, as I have already observed, because the organic soil in which tuberculosis has once struck root would, if not modified, retain susceptibility to a subsequent implantation.

All these researches and all these facts prove positively that it is possible in several ways to produce specific immunizing substances in a healthy man, which increasing naturally augment very decidedly the resistance of the body to tuberculosis.

Will this increase of resistance be sufficient? How long will it last?

I cannot answer this question yet; it is necessary now to carry on researches in that direction. And since the system of vaccination that I have devised is innocuous its application on a large scale would furnish many useful data. By practising this vaccination in families where tuberculosis is prevalent, practising it on a large scale in factories and in industrial centers in which tuberculosis makes havoc, we might perhaps be able to see very soon what value it may have.

My colleagues, I believe that I can foresee this. There are already some possibilities of carrying on these studies on a large scale.

Since milk, the blood serum, the blood and probably also the flesh of immune animals can furnish the human organism with elements of resistance against tuberculosis, why should not these be used as food and furnish along with the normal nutritive material immunizing material?

Why, instead of ordinary milk, should we not use the milk of an immune cow? Why, instead of ordinary meat, should we not eat the flesh of immune animals? On these points scientific investigations are already sufficiently advanced to be of benefit to humanity.

The struggle against tuberculosis, it must be remembered, cannot be efficacious unless it succeeds in curing the organism of it. All the means thought of to destroy the bacilli have fallen short of anything decisive, just as sanitary restrictions have failed in the case of other infections.

The victims of tuberculosis will diminish in number in proportion as the human organism is in condition to resist the disease. In this proposition lies the whole secret of success.

Here in your great country, in which there is so much initiative, here ought to be born a great movement for the practical application to normal daily life of all the scientific truths which we now possess for training the organism to struggle against tuberculosis.

And if this treatise of mine brings forth this as a result, the awakening in America of a great movement of this kind, it certainly will accomplish its highest purpose. And if this movement should originate in your noble institution, your institution will have reached the highest goal to which it can aspire, the goal of redeeming humanity from tuberculosis. I leave you with the faith and hope that this may come to pass.

THE TREATMENT OF NEURASTHENIA.*

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THERE is one fundamental principle which furnishes the reason for every step in the treatment of a neurasthenic patient. The nervous system is a mechanism, and, like the simplest machine it receives a limited amount of energy and expends it. Under normal conditions the amount of energy received has slightly exceeded the amount expended, so that a certain reserve has been accumulated, more or less of which will be used during periods of unusual activity, to be promptly restored during rest. An exhausted nervous system has been so excessively active that food and oxygen have not been able to restore the depleted reserve, and so, whenever a vigorous and sustained action is called for, the machine works badly. It is like a storage battery that has been discharged too rapidly or for too long a time. Accordingly, whatever tends either to check the loss of nervous energy or to increase its income, providing it is not incidentally harmful, is a remedy for neurasthenia.

But, although this principle is clear and simple, its application is generally difficult and intricate. Increase in food and oxygen is indicated, but the increase may not be utilized. An overexhausted storage battery is so impaired that it cannot at once receive a full charge of electricity, and an exhausted nervous system may fail both to control digestion and to assimilate what is digested and brought to it. Rest is plainly indicated but the most stringent abstention from work will be of little or no avail if the more exhausting process of fear or worry is allowed to go on. Accordingly, we have no specific for neurasthenia; there is no magic drug or food, no form of electricity or radial activity, no plan of rest and isolation, no system of mental therapeutics on which we may exclusively rely.

When a difficult thing is to be done there is generally a special combination of resources that will succeed, although each taken singly is futile. To open the door of a safe you must have the right figures rightly arranged, and to get more than an occasional success in treating neurasthenia we must have a combination of favorable influences especially adapted to each individual patient.

Theoretically, the combination should be determined by the condition and individual peculiarities of the patient alone, but the physician is also a person, with his own peculiar resources and limitations, and the treatment must to a great extent be determined by his characteristics. For example, the physician who is buoyant and optimistic will depend largely on the favorable mental influence he exerts while the one whose chief characteristic is scientific accuracy will depend on the physical side of treatment and only secondarily exert a favorable mental influence. Just as no two artists can portray the same person in the same way, so no two physicians can treat the same case of neurasthenia in the same way.

In accord with the fundamental principle we should attempt to divide all remedies into those which, like rest, diminish the expenditure of nervous energy and those which, like food, increases its income. This can be done only roughly, for some remedies are helpful in both ways and others, like electricity, are known to be useful but in ways that are indirect and obscure. Making these allowances, our resources may be tabulated as follows:

I. Remedies whose chief effect is to prevent the loss of nervous energy. (A) Prevention of emotional disturbances; (1) By reassurance and favorable suggestion; (2) By forming the habit of muscular relaxation and repose. (B) Limitation of work. (C) Prevention of toxic conditions. (D) Removal of peripheral irritations. (E) Reduction of cortical irritability by medicines. (F) Sleep.

II. Remedies whose chief effect is to increase the income of nervous energy. (A) Food. (B) Medicines.

III. Remedies used empirically whose action is complex or obscure: Electricity, massage, hydrotherapy, exercise, change of climate.

Emotional Disturbances.—In most cases of neurasthenia the most persistent source of exhaustion is disordered emotion. Beside the ordinary griefs, anxieties, vexations and fears, the neurasthenic has a great many which a normal person cannot understand. There is a long list of diseases, ranging from varicocele to insanity, one or more of which he may imagine to be fastening itself upon him. Experience of the most ordinary kind, such as purchasing a ticket, getting on a car, walking in the street, talking to an acquaintance, and so on, may cause paroxysms of fear. An accidental association of ideas, as when the sight of a knife suggests the idea of stabbing a child, may by the very terror it arouses fix itself firmly in the mind and cause a pitiable fear that it may pass over into action. The inevitable annoyances of life have an exaggerated effect upon the neurasthenic and he reacts excessively to many trifling irritations which a normal person would scarcely notice; under their influence there is a tendency to assume a strained attitude in which the breathing is rapid and irregular and the muscles generally are tense. This condition is an exhausting one; patients often say that they do their best to hold their nervousness in but finally go to pieces. In these and many other ways disordered emotions involve a profound physical effect, draining the patient's strength and preventing its restoration.

The treatment of these disturbances begins with the examination and prognosis. Skilful questions and the careful physical examination convince the patient that his mysterious disease is now understood and the assurance that the case is one of nervous fatigue, that there is no organic disease, no sexual disorder, no danger of insanity, etc., and that the annoying symptoms will no doubt

* Read before the Colorado State Medical Society.

disappear under proper treatment at once places him upon a higher emotional plane. Fear and despondency thus banished will return but repetition of the reassurance will again succeed and for a longer time.

But, although it is of great importance to remove the ideas which might rationally cause a depressing emotion, this is not always sufficient, for such emotions often persist without any rational cause. The neurasthenic knows very well that an inappropriate question ought not to irritate him, yet it may set off an explosion of anger; he knows there is nothing to fear, yet feels horribly afraid. A very valuable resource in controlling a depressing emotion consists in the voluntary suppression of its motor reaction and the imitation of the attitudes and actions which express the opposite emotion. Thus the school-boy about to declaim, who would like to sink through the stage, steadies his trembling limbs, holds himself erect and forces loud tones from his quavering larynx; and in doing so he does not merely conceal his fear, he to a great extent dispels it by displacing the sensations of fear with the sensations of courage. Every neurasthenic should be taught to treat his fears, rational and irrational, in the same way. Too much should not be expected of this artificial courage at first, but if judiciously cultivated it will rapidly develop power for good. On the same principle, the neurasthenic should be taught to avoid the motor reaction to small annoyances and anxieties by breathing easily and slowly, by relaxing all his muscles except those whose activity is really needed, by speaking calmly, in short, by assuming the attitude and expression of complete serenity and repose.

Rest.—The prohibition of work is an obvious remedy for neurasthenia, sometimes too obvious, for it has great disadvantages and is often used to no purpose. The physician must carefully consider the relative importance of work and worry, and to what extent one is dependent on the other. It is very easy to tell a patient that he must drop everything and get away, but this is often a shirking of responsibility. In many cases it is far wiser to keep the patient doing a reasonable amount of work, enabling him to do it by removing as far as possible all other causes of exhaustion.

There are many other cases, however, especially those in which work has been a large factor in causing exhaustion or is inseparable from worry, that require the patient to give up work completely for a time, and unless he is to stay in bed the rest must be combined with agreeable recreation. It goes without saying that short hours for work and many vacations are eminently desirable but it is even more important that the patient should learn not to think of his cares and perplexities in the hours that ought to be devoted to rest or recreation. Everyone should cultivate a sport or hobby of some kind with which to crowd out inopportune thoughts.

Toxic Conditions.—In my experience the so-called uric acid diathesis is a very frequent complication of neurasthenia and much benefit is derived from treating it with an abundance of water and some compound of salicylic acid. Intestinal indigestion is also a frequent complication and although it is generally secondary to the nervous disturbance it should be palliated by appropriate nitrogenous diet, antiseptics (particularly salol) and mild laxatives. Purgation is very badly borne by neurasthenics. The excessive use of alcohol can only increase the degree of nervous exhaustion, if it does not lead to graver forms of disease. Theoretically the use of a strictly limited quantity, taken with food, might be beneficial, but in practice it is so difficult to secure the proper dosage that total abstinence is by far the best rule. The moderate use of tobacco is less likely to be harmful and may often be allowed. Neurasthenics, however, are especially sensitive to it and in some cases it must be given up altogether.

Coffee or tea should be allowed in any moderate amount to which the patient has been accustomed providing it does not interfere with sleep.

Peripheral Irritations.—The pain and annoyance due to disease in any part of the body may be a contributory cause of neurasthenia. The most important of such sources of irritation are disease of the intestine, anus or bladder, pelvic diseases of women, eye-strain and disease of the ear causing pain, tinnitus or vertigo. Such local diseases should generally be treated but their importance should not be exaggerated and severe measures must often be avoided or postponed. Strictly neurasthenic or hysteric pains must not be attributed to local disease; their treatment by local applications is almost invariably harmful because it fixes attention upon them and increases worry.

Reduction of Cortical Irritability.—In most cases the patient has become so sensitive to all unfavorable influences that even when sheltered from them to the utmost possible extent they still annoy and exhaust him. This is because the cerebral cortex is in a condition of irritable weakness and it is highly desirable that its irritability should be reduced. Many physicians try to do this by means of bromides but my own belief is that bromides continued for any length of time in efficient doses aggravate the disease. Codeine, in doses of one-fourth to one-half a grain three or four times daily, acts far more happily and helps toward a permanent cure. Opium in small doses, one-twelfth to one-fourth of a grain of the extract, is still more useful but in prescribing it the possible danger of the opium habit must be taken into account. It should be prescribed only in combination with other remedies, particularly strychnine and laxatives, so that the patient will have no discretion as to the size or frequency of the dose and will quickly get into trouble if he exceeds directions. This simple expedient almost wholly removes the danger. As a further safeguard the patient may be kept in ignorance of the ingredients of his prescription either by writing in such Latin as he cannot comprehend or by advising him not to read it for the general reason that any attention to the remedies exaggerates the symptoms. Opium is especially valuable in cases of morbid

fear and in those in which the recurrence of an agonizing idea makes the patient fear that he is becoming insane; in the latter it is indispensable. Unless the physician is convinced that the case is serious enough to justify the use of an opiate and confident of his own ability to use it skilfully he ought to withhold it and it should be discontinued as early as possible; but some cases are so serious and so obstinate that we cannot afford to reject so useful a remedy.

Sleep.—Neurasthenics should sleep as much as they can. If insomnia is troublesome at first it often yields to the combination of remedies chosen, without requiring the use of a direct hypnotic, which should always be avoided if possible. When wakefulness becomes a serious matter chloral is generally the best hypnotic; it is more efficient and less likely to cause depression of spirits next day than either sulphonal or trional. It should generally be omitted every second or third night and altogether discontinued as soon as possible.

Having reduced the waste of nervous energy to a minimum it will be much easier to increase its supply than if the latter alone were attempted.

Food.—The essentials in regard to food are that it should be abundant and taken at short intervals, that it should be rich in nitrogenous and phosphorized articles such as meat and eggs and that it should be eaten without fear of possible consequences. All theories about the stomach needing a rest must be ignored; it is the nervous system that must be rested and the digestive organs must be made to do their work. Anxious attention to diet does nothing but harm and digestive ferments seem to me to be altogether useless. On the other hand, strychnine, small doses of calomel and intestinal antiseptics are often of great service in aiding digestion. The weight should be recorded from time to time and its increase is a most valuable exhilarant for the patient who has been losing.

Medicines.—Many attempts have been made to supply nervous energy through drugs, on the whole with very little success. Phosphorus, phosphide of zinc and the hypophosphites I long ago discarded because they never seemed to be of the slightest use and the first two were generally distinctly harmful. The glycero-phosphates I have never tried, believing that if they are really useful the phosphorus compounds of eggs and meat are still better.

Strychnine probably stimulates the nutritive processes in the nerve cells and it seems to me to lessen the irritable weakness which is so characteristic of neurasthenia. Arsenic in its older, irritating forms is more likely to do harm than good, but as cacodylate of sodium it may be given much more freely and, with iron, is especially indicated in anemic patients. It is probably useful in other cases but I find it hard to be sure.

All neurasthenics are apt to infer from their bad feelings that their medicine is disagreeing with them and if the physician makes many changes on this account his usefulness will soon be at an end. Hence it is very important, in the early stage of treatment, to prescribe doses so small as to be absolutely safe and only for a very few days at a time. Then if there is any question as to the effect of the medicine one must insist that it is exactly right and that every bit be taken as originally ordered. The doses may be gradually increased according to need and when confidence has been established one may prescribe much more boldly.

Such remedies as electricity, massage, hydrotherapy, exercise and change of climate have been left to the last because I regard them as decidedly least in importance. Any of them may be used to advantage, especially for its psychic effect, as an adjuvant to a combination of the remedies already mentioned, but it would be a serious mistake to exalt it to the chief place. Most patients have a tendency greatly to exaggerate the physical action of remedies of this class and the physician ought gently to check this tendency. It is better to give the patient a rational explanation of the nature of his malady and a just idea of the proportionate value of remedies, thus guarding him from his morbid tendency to fads; the immediate effect of the mental impression may not be so brilliant but the permanent results will be far better.

Electricity.—In most cases of neurasthenia electricity may be used with distinct advantage although it is hard to say how much of its influence is mental and how much physical. I am in the habit of passing the galvanic current from the positive pole over either temple to the back of the neck on the opposite side, turning it on and off gradually and not exceeding a strength of three to five milliamperes. This may cause a little dizziness at first but tolerance for stronger currents is soon established and the applications seem to be especially useful in cases in which vertigo is a prominent symptom. The static breeze and spark are also useful, especially when applied to the seat of morbid sensations. The sensory stimulation seems to aid in replacing the morbid feelings by normal ones. Faradism may be made to serve the same purpose but as it is less convenient I do not use it except for diagnosis.

Massage.—I have had far less experience with massage than with electricity and wish to speak cautiously of it. Its effect in moving blood and lymph from the periphery toward the heart is well known and is of the greatest service in the rest cure during the time when active exercise is prohibited. The sensory stimulation may also be useful. The objections to it in ordinary cases are the extra expense, the time required, the fatigue involved and the danger that an enthusiastic and self-sufficient masseur will have a bad influence in presuming to give advice on matters altogether out of his province. In my own practice the objections have generally outweighed the advantages and the last objection has been most serious with masseurs recommended most highly by distinguished neurologists.

Hydrotherapy.—Although highly esteemed by men whose judgment commands respect hydro-

therapy is comparatively little used in this country. For neurasthenics the more elaborate methods have the same disadvantages as massage and are hardly applicable in private practice. The popular Turkish bath is generally harmful. On the other hand, a cool sponge bath in the morning is capable of doing a great deal of good, provided prompt reaction is secured and fatigue avoided. The water should not be too cold and with elderly patients the shock of cold water should always be avoided on account of the violent fluctuations of blood pressure caused by it. A comfortably warm bath at night may favor sleep and if it does there can be no objection to it.

Exercise.—The general principle of exercise is of great importance; its application, however, requires nice discrimination. I never allow my neurasthenic patients to go into a gymnasium or to take any form of so-called health exercises. On the other hand, every effort should be made to re-accustom the patient to his normal activities, first to his recreations, afterward to his work. For example, many patients say they can no longer read on account of the disturbance it causes. This real or fancied inability deprives them of a most valuable solace and diversion. In the absence of any serious disease of the eyes it is generally wise to instruct them to read for ten or fifteen minutes each day, no matter how unpleasant the effect may be nor how attention may wander, at the same time assuring them that only good can come of the attempt. The patient soon finds that he can read much more than he had thought possible and by gradually extending the time the ability to read in moderation is soon reacquired. Of course the physician must be careful not to demand too much at first for the avoidance of fear and of undue fatigue are essential. The same principle applies to walking, going about the city, meeting friends and, ultimately to work.

Climate.—Change of climate will generally be avoided if possible but it may be absolutely necessary when, as in the tropics or in malarial regions, the climatic conditions are an important factor in the causation of neurasthenia. There is a popular impression, shared to some extent by physicians, that the altitude of the Rocky Mountain region is a cause of neurasthenia and that persons becoming nervous here should forthwith "go to a lower altitude." This, I am quite sure, is a mistake, at least as far as altitudes of less than 7,000 feet are concerned. But if a patient in surroundings that are ordinarily healthful is to abandon his work for a time it may be well to consider whether removal to a different climate may not be advisable, provided good medical attendance and other necessary advantages can be obtained there. If a change is to be made those patients in whom irritability and restlessness predominate had better go to a moist, warm climate, while those who are languid and debilitated will do best in the dry, bracing air of mountain regions. In any event the place chosen must afford opportunities for agreeable rest and recreation.

The real difficulty in treating neurasthenia is not to know the remedies that may be used but to select and make effective that combination which best suits the individual patient, taking into account all his circumstances as well as the features of his disease. This problem the physician should approach in the spirit of an artist rather than in that of a pure scientist. He must select and emphasize some resources and ignore others. For his worst cases, if they can pay for it, he will generally choose the combination devised by S. Weir Mitchell and known as the rest cure. But if he does not have some of that great man's success in happily influencing the patient's mind, the rest, food, electricity and massage will do but little good and may even make matters worse. His greatest skill will be demanded by those who are not financially able to command the luxuries of the rest cure, who must continue at their work or return to it at the earliest possible moment, and yet must recover their health.

ABDOMINAL ASCITES WITH 150 TAPPINGS.

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ROSA W., Hungarian, sixty-nine years old; married when seventeen years old, widowed ten years; never been sick before. Mother died of cancer of the stomach at the age of sixty-nine years; father died when 102 years old, brother died of pneumonia when thirty-four years old; another living, sixty years of age; three sisters living, ages fifty, fifty-six and seventy years.

First menstruation when she was thirteen years old, regular. She had 12 children, last child twenty-five years ago; miscarriage of three months 23 years ago. Four children died, 8 living. Menopause at 50. She first became ill nine years ago with pain in the region of the liver, nausea, bilious vomiting and constipation; this pain in hepatic region shooting down into the right thigh and leg. Examination presents a slightly enlarged liver, painful to touch; heart, lungs and spleen normal. Microscopical examination of urine excludes kidney lesion; no diabetes. Vaginal examination presents slightly enlarged uterus, adnexa normal.

After a lapse of four months since this onset, patient's abdomen began to swell, ascites was gradually developing. No edema of legs present. At the end of five months the accumulation of abdominal fluid necessitated the first paracentesis, which took place in the year 1894 when 15 quarts of transparent straw-colored fluid were removed in one sitting. Patient rallied for a short time. Two months after her condition required a second tapping, which again withdrew about 15 quarts of fluid. Since this second tapping she kept fairly well with no advancing ascites for one year, when, in order to relieve dyspnea and obstruction to the organs, a third tapping was resorted to

and again 15 quarts of fluid removed. Since then patient has grown weaker, anemic and could not bear the presence of a large amount of fluid, which now accumulated more rapidly, say, about 10 quarts during every four weeks, and, therefore, systematic tappings every four weeks during the next five years and every two weeks for the following two years were found necessary. Amount of fluid at each sitting about 9½ quarts.

During the ten years of her ailment she has been tapped 150 times. Fluid from the abdominal cavity is of a pale straw color of specific gravity 1.015; has very slight amount of sediment after centrifugation and microscopically presents few leucocytes, some fat globules and few endothelial cells, staining shows no organisms present and no tubercle bacilli. Above tappings were done with a medium trochar, wound at the side of puncture healing perfectly. On several occasions attempts were made by me to insert a small drainage tube into the puncture opening and leave it in situ, but on each occasion symptoms of weakness and uneasiness on the part of the patient required its removal. Again, very slow removal of fluid through a small-sized canula did not bring about any decided change.

From the very beginning of the patient's ailment I have urged her to submit to a radical operation, but surgical interference has been refused, and this fact accounts for the numerous tappings performed on her during this long period. She is now in a fairly good condition, not bedridden save for a day or so after each tapping. She is quite active in her household and takes her bi-weekly tappings quite heroically and is willing to submit to this minor suffering rather than undergo the risk of an abdominal operation. Her temperature now is normal, pulse 92. Amount of urine discharged during twenty-four hours, about 48 ounces; acid reaction; spec. grav. 1.026, no casts; only small amount of earthy phosphates present. She has a slight edema of the legs, which disappears after each tapping. The circumference of her abdomen before tapping measures 47 inches; from the sternum to the pubes, 20 inches. After each tapping careful examination is made, but no tumor or neoplasm can be mapped out.

Her uterus is enlarged and presents a nodulated hard mass simulating a fibroid uterus. Adnexa could not be mapped out; no enlargement in the region of mesenteric glands to suggest mesenteric lesion as the cause of obstruction to the portal circulation. Syphilitic lesions excluded by the history of the patient. Long-standing of the disease and fair condition of the patient exclude cancer of peritoneum or neighboring organs or tuberculous peritonitis.

We can think of a neoplasm pressing upon the large veins and obstructing the return circulation, thus producing this pathological condition of dropsy. This is a tentative diagnosis of an ovarian cyst with formation of old adhesions. The necessity of an exploratory laparotomy has been urged by many medical men as well as gynecologists who had occasion to see this patient, among whom were the late Dr. Paul Mundé, Dr. H. Boldt, Dr. A. Brothers, Dr. Alfred Meyer and others.

The following figures present a medical curiosity: During the ten years of my patient's illness the first 3 tappings gave 45 quarts and next 147 tappings at 9½ quarts, 1,396½ quarts; or, together, 1,441½ quarts or 2,883 pints or fluid pounds; or 360⅜ gallons.

Scott reports (Anomalies of Medicine, Gould and Pyle, 1900) a case of ascites in which 928 pints of water were drawn in 24 successive tappings. Van Wy mentions 1,256 pounds of fluid being drawn from abdomen of a woman in five years. Kaltschmidt describes a case of ascites in which in 12 paracenteses 500 pounds of fluid were removed. In 1721 Morand reported 2 cases of ascites, in one of which by means of 57 paracenteses 970 pounds of fluid were drawn off in twenty-two months, in the other 1,708 pounds in ten months. There are several cases on record in which ovarian dropsies have weighed over 100 pounds. Blanchard mentions a uterine dropsy of 80 pounds. Philosophical Transactions contain account of a case of hydronephrosis in which there were 240 pounds of water in the sac.

This case presents several interesting points: (1) On account of numerous tappings and large and continuous accumulations of fluid a human body could produce. (2) The advanced age of the patient and tolerably good health, unimpaired by the long, continuous drain of the constitution and obstructive circulation to the vital organs. (3) The possibility of a permanent cure of this chronic abdominal ascites by a radical operation, which would tend to break up the old adhesions and fasten the omentum to the parietal peritoneum, thus relieving the obstructive portal circulation and establishing a peritoneal circulation.

GASTRO-ENTEROSTOMY WITHOUT A "LOOP."*

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THE mortality of gastro-enterostomy is still so high that few medical men will consider the operation within the domain of practicable therapeutics. It is more often regarded as a proper means of providing euthanasia. But there is one group of statistics, that from Czerny's clinic in Heidelberg, which represents a particular method of operating, and which has given, in benign cases, a death rate of only five per cent., almost as low as that for the interval operation for appendicitis. It is the more worthy of emphasis as it seems to have received little notice in contemporary literature.

The success revealed in this group of statistics is due to the fact that the method of anastomosis preserves the proper anatomical relationship of

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the stomach and gut. In all the other eighty odd methods which have been advocated, except gastro-duodenostomy, this relationship has been violated. The causes of death as given in their usual order of frequency are: (1) Shock, collapse, asthenia or inanition, all practically the same when the debilitated condition of the patients usually considered ready for so grave an interference, is considered; (2) infection and peritonitis as the result of contamination during the operation or subsequently. There is a connection here with the most frequent causes of death in that the perfectly healthy peritoneum can take care of a great deal of sepsis, but the diseased abdomen of a weakly person is quite another matter. Nevertheless such excuses are not altogether valid, and there is room for improvement. (3) Pneumonia, an accident liable to occur like shock or collapse, after any operation on debilitated individuals, especially after the deep narcotization so often necessary to obtain relaxation in the presence of epigastric wounds. Such wounds also interfere afterwards with coughing and clearing of the respiratory tract. It has often been attributed to the inhalation of stomach contents during the operation, a possibility which should be avoidable by lavage just prior to the anesthesia. (4) The fourth most common cause of death, and in the minds of most surgeons it probably ranks much higher, is obstruction in one form or another. That accompanied by "vicious circle vomiting" is by far the most common and is dependent upon the escape of stomach contents into the proximal instead of the distal segment of the anastomosed gut. The lumen of the distal segment becomes displaced from its intended position opposite the opening in the stomach and seems to be mechanically occluded by the pressure against it of the distended adjoining proximal segment. There may also be a physiological factor in the process, as Chlumskij has shown by animal experimentation, that filling of the duodenum inhibits the peristalsis of the stomach. This accident caused a fatal ending in the second gastro-enterostomy on record, and the numerous modifications of the original method which have been introduced to avoid it, testify to its importance and reveal the dread of it as a factor in much of the other mortality. But complicated and time-wasting procedures, often involving multiple openings in the gut, with all their increased chances of sepsis, can be largely eliminated, and if, in consequence, the death rate can be brought down to five per cent., the operation should not be considered one of last resort.

All except two or possibly three of the methods are what might be called "loop" operations. That is, a loop of jejunum or ileum is carried in front of the colon, or behind it through its mesentery, and joined to the front or back of the stomach. The length or shortness of the loop, the relation of it and its legs to each other, or the stomach and isoperistalsis, are of some importance, as a loop operation is quite often the only one possible. To avoid dangerous vomiting, an ever present chance in this method, experience has demonstrated that the proximal leg of the loop must at least be long enough to escape tension, or compression of the colon; that a broad curve where it is attached to the stomach is better than a sharp angular one; that the principle of isoperistalsis should be observed; that the fistula should not exceed 1½ to 2 inches in length, for if it does the difficulties of suturing favor spur formation; that the fistula should not be smaller than the diameter of the gut for fear of cicatricial contraction; that it should be as near as possible to the greater curvature or in the most dependent portion of the stomach; and above all that there should be an enteroanastomosis at the base of the legs of the loop. Roux's method of gastro-enterostomy "en Y," one of the three which does not involve a loop, approaches the correct anatomical relationship, but aside from the dangers of vicious circle vomiting, which has occurred even in Roux's operation (apparently from error in technic), and of obstruction by volvulus of the loop or hernia over it of the rest of the intestine, there are also in all such methods the added risks dependent upon time-consuming procedures and multiple openings in the gut. The operation in two stages, of which the McGraw elastic ligature is the best known, though a reasonable guarantee against infection, if used with the "loop" possesses all the disadvantages of that method and some additional uncertainties. Of the great number of mechanical appliances which have been brought forward, the Murphy button is, of course, the best, and is occasionally almost indispensable. Its well-known tendency to fall into the stomach and remain there, especially when the line of anastomosis is reinforced by suture, even in spite of Hildebrand's and Weir's modification of the distal half of the button, is a very serious objection to its use. There is at least one case on record in which after death from hematemesis, subsequent to gastro-enterostomy, the button was found imbedded in an ulcer in the stomach. There are, to be sure, numerous instances of its indefinite retention without symptoms, one for 6½ years, but there are always unpleasant possibilities. Nevertheless in all loop operations in addition to the usual advantages of saving time, the button has a definite usefulness in a certain amount of protection against persistent vomiting. One surgeon of large experience informs me, that before he adopted it he lost many cases from this complication, but since using it regularly he has not, in some sixty or seventy gastro-enterostomies, had a single instance of the vicious circle difficulty (and he always used the loop method). His experience seems better than most operators, but at any rate, the presence of the button in the summit of the loop tends to prevent angular kinking. The great number of other devices of a similar nature shows the need of one which, unlike them, can be employed without risk of extravasation of intestinal contents at the time of introduction, or later; which establishes the desired fistula immediately; which is as quick in applica-

tion as the button, and is certain of not remaining in the stomach or duodenum. Until such an appliance is invented, and there is a real need of one, the suture remains as the preferable means of joining the stomach and gut, when time permits.

Of the remaining two methods not involving a loop, the first to be mentioned is gastro-duodenostomy. The union of the stomach with the descending duodenum, introduced by Billroth for restoring continuity after pylorectomy and improved by Kocher, had been utilized in certain cases of benign stenosis by Henle and then Villard, but lately has been advanced by Finney as a substitute for all gastro-jejunostomies. In the Finney operation, its prototype the Heinecke-Mikulicz pyloroplasty, is amplified by transposing the transverse anterior division of the pylorus into a horseshoe-shaped ∩ incision six to ten inches long through the under part of the pylorus and adjoining greater curvature of the stomach and descending portion of the duodenum. This large opening provides free drainage and is anatomically and physiologically correct, and when circumstances permit the few written reports and the many verbal ones I have heard, seem to favor it without qualification. But gastrojejunostomy, if only because it is simpler, is undoubtedly a necessity for the greater number of cases, and the method described by Petersen, as used in Czerny's clinic is the one I wish to call attention to. He reports 215 cases without a single instance of serious vomiting. It is based on the simple anatomical principle that the first few inches of the jejunum descend vertically behind the stomach without any turns, and in this part lie directly in contact with the posterior surface of the stomach, separated from it only by the non-vascular portion of the mesocolon.

The ordinary retrocolica posterior operation is performed by drawing the omentum and transverse colon out of the median epigastric wound, and stitching the margins of the exposed posterior surface of the stomach near the greater curvature, to the edges of a rent made in the mesocolon. Then the jejunum near its origin is held perpendicularly to the spine, and attached some two to four inches below its origin at the plica duodenojejunalis, to the exposed posterior surface of the stomach by a row of Lembert sutures placed transversely to the long axis of the gut, and in its free border. In front of this the stomach and intestine are opened with due precautions, and the fistula completed as usual with stitches or the Murphy button and surrounded externally by a continuation of the Lembert stitches. The proximity of the fistula to the plica is determined by the degree of dilatation of the stomach, and the location of the lower border of that viscus should therefore be noted as soon as the abdomen is opened. My own rather limited experience with this method has been in favor of suture only, but if time is limited, then the button reinforced by suture externally. The jejunum is thus anastomosed to the posterior surface of the stomach in its normal descending position and without any twists. There is no loop to become occluded, and no chance for vovulus or hernia above it.

The following cases serve well to illustrate the application of this method. They were all operated upon in the St. Francis Hospital:

Case I.—M. H., thirty-years old, laborer; presented all the symptoms of pyloric cancer with an epigastric tumor, persistent vomiting and pain. In addition he had pulmonary phthisis. Operation July 27, 1903, by the Czerny-Petersen method with a Murphy button reinforced by sutures. The anastomosis was accomplished at a point about two inches from the beginning of the jejunum. Recovery uneventful; liquid food was given the following morning or within fourteen hours. Thereafter there was no pain and no vomiting, and the patient rapidly improved. He left the hospital at the end of a month without having passed the button. I have since heard that he died sometime in November from his phthisis.

The relief of the vomiting in this case was to be expected, but the total disappearance of pain was more worthy of note and indicated what may be done for irremovable gastric cancer even without pyloric obstruction. Furthermore, some thickened simple ulcers of the stomach are indistinguishable from cancer without the aid of a microscope, and for these gastrojejunostomy is curative.

Case II.—A. D., fifty years old, female servant; gave a typical history of chronic gastric ulcer, with epigastric tenderness and vomiting. The latter occurred regularly after taking food. She steadily lost ground, although under medical treatment for three weeks. Operation August 18, 1903, by the Czerny-Petersen method with a Murphy button reinforced by suture. The anastomosis was made about 3½ inches from the plica duodenojejunalis.

Liquid feeding was begun the following day. There was no vomiting and no complaint of pain. But about a week later a bad cystitis developed from catheterization. This was followed by uremia and death on August 31. Autopsy showed the anastomosis perfect but with the button in the stomach. The latter was somewhat contracted (at the time of operation its lower border reached to the umbilicus) and funnel-shaped with the fistula at the apex. No ulcer was discovered. The cause of death was a suppurative cystitis and pylonephritis. The other organs were normal.

This case was probably one of chronic gastritis, with dilatation and the constant distress and vomiting, with the consequent inability to work, and loss of flesh and strength seemed to justify the operation. At any rate, the relief was marked until uremia developed.

Case III.—M. P., forty-five years old, housewife, was sent to the hospital with a diagnosis of gastric ulcer or carcinoma. While under medical treatment and observation there was a constant complaint of epigastric pain after taking food,

and there was occasional vomiting. There had been a loss of forty pounds in weight in the past six months. There seemed to be a small tumor in the region of the pylorus. Operation September 26, revealed a cirrhotic liver and a slightly congested and thickened area, anteriorly, near the pylorus and lesser curvature. A gastrojejunostomy was performed as in the other cases, about three inches below the end of the duodenum. As the button had failed to pass in the other patients the anastomosis was accomplished by suture entirely, the gut being opened transversely around its free border to an extent equal to half the circumference. Liquid feeding was begun the next day, and the complaints ceased. The patient left the hospital at the end of three weeks, professing to be relieved, but without any noticeable gain in weight.

I have since heard that the former symptoms have returned, and believe them due to a closure of the fistula. Mayo has called attention to the need in such cases, of artificially narrowing the pylorus to prevent obliteration of the new opening. The condition of advanced cirrhosis in the liver might properly be said to have caused all the symptoms here, and to have contraindicated any operation. The propriety of the interference seemed questionable when the liver was carefully observed, but the operation had then progressed so far that it was deemed best to complete it, and the subsequent relief of the gastric symptoms while in the hospital, has justified it in my eyes. That a relapse has occurred shows the error in technic in not narrowing the pylorus. This was thought of during the operation, but the method, by suture, had taken so long (fifty minutes) and the patient was so asthenic, that the precaution was omitted.

Case IV.—A. R., twenty-eight years old, housewife; came to the medical service with a history and diagnosis of gastric ulcer. While under treatment she developed a suppurative appendicitis for which I operated in July. During and after recovery the gastric symptoms persisted. There had been an occasional hematemesis. The woman was extremely emaciated and seemed starving to death. Operation on September 27 by the Czerny-Petersen method revealed nothing abnormal in the gross appearance of the stomach, although there seemed to be a thickened area posteriorly near the fundus. But the general condition did not warrant a very careful exploration and the anastomosis was done with a Murphy button reinforced by suture as quickly as possible. The fistula was placed about 2½ inches below the beginning of the jejunum. Recovery was uneventful, liquid feeding was begun that night on account of the great asthenia, and there was a noticeable and rapid gain in strength and weight.

The vomiting ceased, and for several weeks the other complaints also. The button has not been recovered and lately some of the symptoms seem to have returned probably from contraction of the fistula as the pylorus was not narrowed and also possibly from the irritation of the stomach by the retained button.

Case V.—A. H., fifty years old, mechanic; had a Heinrich-Mikulicz pyloroplasty performed by me in December, 1902, for cicatricial stenosis. During the subsequent six months he was perfectly well and gained thirty pounds in weight. Then the obstructive symptoms began to return and on October 5, 1903, I made a gastrojejunostomy by the Czerny-Petersen method, using sutures only, and placing the fistula about 3½ inches below the end of the duodenum. As in Case III the opening in the gut was made transversely to its long axis and included one-half of the circumference of the free border. The condition of the pylorus was interesting. At the first operation nine months previously, the pyloroplasty before closing the abdomen had comfortably admitted the index finger invaginating into it the anterior wall of the greatly dilated stomach. In the second operation the pylorus was surrounded by adhesions, high up under the liver, and seemed practically closed. Recovery from the second operation was uneventful, and I found the patient at work in his shop on the eleventh day afterward. All symptoms have been completely relieved except that he tells me he has to be careful of his diet. Fermentable foods seem to cause dyspepsia, otherwise he is as well as ever. He also says that for the first few months after the first operation he had no discomfort at all and could eat anything, whereas now he has no discomfort as long as he avoids sugars, starches and cabbage. As he is an intelligent man, it seems to show that a gastroduodenostomy is preferable to gastrojejunostomy and helps to demonstrate that the former is physiologically better when possible.

If the retrocolica posterior method as described above, is impracticable, owing to adlesions or the location of the disease, then an anterocolica anterior anastomosis may have to be undertaken. For this statistics favor the loop operation with an entero-anastomosis at the base of its legs. Roux's method "en Y" with transverse section of the gut and its mesentery and implantation of the distal segment into the stomach and of the proximal into the distal lower down, is perhaps anatomically better, but involves numerous unpleasant possibilities and has not proved popular.

Whatever method is employed, and however excellent the immediate result experience has shown that gastro-enterostomy is not to be practised without good reasons. The contraction of the fistula and means for preventing it have been mentioned and the retention of the button. Peptic ulcers in the jejunum have several times been verified after death from them by perforation and hemorrhage. There has sometimes been a troublesome diarrhea of longer or shorter duration, and quite frequently an impaired digestion for fats has been noted. But the operation is universally conceded to be the only relief for benign or malignant pyloric stenosis, though not as generally accepted as it should be for painful, simple

or neoplastic ulcer. It is by all means the simplest and safest method of dealing with the repeated hemorrhages from benign ulceration, and I believe it will come into general use for much of the intractable gastric indigestion which incapacitates the patient for hard work, especially for atonic and dilated stomachs.

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HOME TREATMENT OF THE TUBERCULOUS "IS JUST AS GOOD"—BUT IT IS NOT.

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History repeats itself in medicine as it does in society. The feverish excitement and consequent reaction in the political and financial worlds find their counterpart in the evolution and enthusiasm of certain theories and their gradual decline and even slow death in the medical domain.

A short review of the methods or rather opinions in reference to the treatment of consumptives within the last two decades would assist us to elucidate the points we intend to discuss.

The Serum Theory.—It is within the recollection of nearly everyone of you when a number of physicians, small and big, poor and rich, left their homesteads for the Mecca—Berlin, where they would learn of the methods of administration and procure the tuberculin. It was a famous exodus. But in the height of the excitement the disciples had not followed the detailed instructions of the famous apostle. Instead of administering the serum in small and gradually increasing doses, the physicians carried off the trophy with the idea that the more the merrier: the tuberculin was given in exceedingly large quantities to the detriment of the reputation of the serum, the great discoverer, the pupils and the patients experimented upon.

Racing homeward, to be the first ones to herald the news, the exponents of this new discovery failed to be impressed by Robert Koch that this remedy is not to be administered to patients with any degree of temperature. Because of the lack of the above-mentioned accuracy—a reaction set in, the serum fell in disgrace and still more, it was pronounced dangerous. Hence the impression upon the lay mind: "no cure for consumption." And yet, quite recently, the same serum in the hands of well-known clinicians, applied in proper dosage and in appropriate cases, is reported to prove beneficial and even to possess positive curative properties.

The Climatic Treatment.—That change of climate in general, certain climates in particular and fresh air above all are beneficial in the treatment of the tuberculous was recognized in the prehistoric era. Nothing new under the sun. But theories became dominant and current that consumptives (indiscriminately) are being cured (?) when sent to high elevations. The higher the better. There hemorrhages cease, patients take on flesh in no time and get cured as by magic. Colorado and its climatic surroundings became the Mecca this time—and thousands upon thousands, incipient as well as far-advanced cases, flocked there. Taken from the East on stretchers, arriving in the Far West, a few are benefited, more are returned home in "boxes" or advised to return home, there to await the inevitable.

What hardships had those unfortunates to undergo before they reached Colorado; before they were installed in any appropriate place. What fortunes are expended (we have in mind the Eastern people and the poorer class from whose midst the mass of consumptives is recruited, and for whom a hundred dollars is probably the savings of a lifetime) and no cure, nay worse than that. Thrown among strangers, far away from home and surroundings many become homesick, many are exhausted from prolonged travel and lack of adequate accommodations on arrival, they find themselves in a worse condition than when they left their homes in the East. It takes quite a number of weeks to recuperate if they do at all. Again those with cardiac disease complicating their pulmonary affection fare badly at very high altitudes. Hence many a one who should have been advised against undertaking such a trip but should have remained at or near home, entrusting their fate to Providence—inevitably raise lamentations and also repeat, "there is no cure for consumption." Their respective physicians learning of the "results" are losing heart and faith in high altitudes. Yet there are cases upon cases known to us who merely held their own while down here, even in the mountainous regions, have done remarkably well in Colorado or in the Southwest.

Sanitarium Treatment of the Tuberculous.—The next step in the evolution and in the right direction was and is the sanitarium treatment,—sanitaria located within easy reach by the afflicted and by their respective families, located in the mountains at a moderate altitude. This idea held sway unshaken for a number of years, and greatly encouraged by clinicians and justly so supported by the medical press.

Experience has taught us by this time to be circumspect in our prognostications in any given case, not to be too optimistic as to positive and permanent cures in tuberculosis. We must bear in mind that not all cases, even under the best of treatment and surroundings, will recover. We should be elated and greatly encouraged if some good results occur, skeptical as we are (and in truth we should be) to the overwhelming reports of high percentages of cures.

The writer's experience in closely observing more than five hundred cases in his sanitarium and following up cases in private and consulting practice, also of other close-by sanitariums, is that tuberculosis is not as easily, or as speedily

and, above all, as permanently cured, as many would have us believe.

It is a melancholy statement, I confess, but it is unfortunately true, based as it is upon personal observation and close study. There may be extenuating reasons for the poor showing, but at any rate the millennium has not come as yet. It is our belief, however, that the sanitarium is the ideal place for those of the incipient as well as second stage cases.

Those of the first class have certainly justifiable expectations for full recovery, provided they are enabled to stay out long enough. Not being far away from home they are frequently visited by relations and friends, on certain occasions they might be allowed to take a short trip home, and thus break the monotony of sanitarium life,—hence no home sickness.

We will not dilate upon the benefits the tuberculous are bound to derive in a properly conducted sanitarium. We will only mention that routine and discipline are more essential to recovery than mere cheerful home surroundings. The open-air treatment which is at present universally recognized can nowhere be so satisfactorily carried out as it is in a sanitarium where each and every inmate is under direct supervision of the physician in charge, while nurses ministering to the comforts of the patients, help and urge to carry out the rules of the institution. In the treatment of tuberculosis like in that of other diseases we must often strenuously ignore all the whims and supposed inclinations. Mothers' unmasked anxieties, sisters' indulgences on one hand and shunning of the afflicted by his previous friends on the other, are not conducive to and very often miscarry the good results expected. They may kill by kindness.

Utilizing the aforesaid as a stepping stone we will alight now to the consideration of the so-called "home treatment" of tuberculosis which is by some deemed "just as good" as sanitarium treatment. Is this a new idea, and, if so, what is its underlying principle? Or is it a reaction number three? Then, we ask, after which great enthusiasm did it set in? Being aware, however, of the fact that the advocates or promoters of the idea of the "roof and fire escape" treatment of consumption as an imitation of sanitarium open-air methods have in mind only those hopelessly poor who can under no circumstances better themselves otherwise, we wish nevertheless to emphatically protest against this "new treatment," the "home treatment," which means in reality, as we will explain later, nothing more than a return to the primitive methods, but having obtained the significance of a "new treatment" will imply the casting aside of the old—the rational one.

Our nation is a reading public; no medical topic is foreign to them, and not all are capable or willing to digest the whole, and many are satisfied with headlines, and consequent dyspepsia is the result.

We wish to sound a note of warning that if this new idea shall become current and, so to say, popular, it will harm a seventh part of humanity, the consumptive, in more ways than one. "Some air is better than no air" say the benevolent savants of their new concocted doctrine, and, therefore, if the poor patient is yet in a physicial condition to climb three or four flights of stairs he is advised to ascend to the roof and stay there. He may also put a bed on the fire escape and enjoy "open-air and fresh-air treatment" up there. But foul air is bad air and is in no way fit for ventilating a septic and decomposing lung. Who are the would-be recipients of this fruitful advice? These are tenement-house dwellers, the tenements being situated in the heart of crowded districts, where myriads of microbes are floating in the air and ready to nestle themselves in the nostrils and the mouth of the person who, while sitting on the roof and believing to inflate his lungs with fresh air, inhales and swallows objectionable and deleterious parasites. The roof or the fire escape, being fifty or even one hundred feet above the ground, does not convey to our mind even a tolerable imitation of country life. To live near parks would certainly be beneficial for these consumptives who are compelled to stay in the city and at home—but how many of those poor people can afford to indulge in such luxuries—rents being so high? Again, presuming for a moment that the fire escape and the roof air should be of benefit, how much of it would the patients enjoy? We certainly want for them sunlight all the time—at least most of the time, but our earth does not pay much attention to their needs, it keeps on turning on its axis, carrying the patient, the tenement house, including roof and fire escape away from the healing sun rays, and would not linger for Mr. A., nor even for Mrs. G., for the shortest conceivable time. We must also bear in mind that the tenement house roof is common property for twenty or thirty families who use it as a drying place for their weekly laundry—and our consumptive may prove quite an unwelcome visitor up there on one hand, on the other hand the fumes emanating from the newly washed linens do not tend to improve the condition of the "lunger." The fire escape again, must be, and justly so, unencumbered for the escape of tenants in case of fire, and we should be the last ones to openly conflict with the adequate regulations of the city authorities in advising our patients to violate the law by putting a bed or an easy chair there. We may advise our patients to visit parks, but this may prove for many very fatiguing, for many physically impossible, and for a number, in the crowded districts, the parks are as thickly populated and dusty as the tenements themselves.

And who is to take care of the consumptive "at home?" This certainly devolves upon the poor wife or mother who has her hands full in caring for a number of small children and the house. Can she do it in any way approaching satisfaction?

We should not fail to mention the fact that every consumptive at any stage of his or her sickness, under the tenement-house surroundings, is positively a source of infection to immediate family and neighbors, all instructions of health boards and attending physicians notwithstanding.

We must also dwell for a while longer on the point of indulgence we mentioned before. Not to aggravate the husband, the son or the daughter, the wife or mother will often ignore the iron-clad rules laid down for the patient by the well-intentioned physician in charge, and not only miscarry the instructions but unwillingly harm their charge, no matter whether it concerns the hours our patient shall spend outdoors or the quantity and quality of food he or she is allowed or prohibited to indulge in. From our actual experience in maintaining tuberculosis patients in our sanitarium we have convinced ourselves that they are capricious, irritable and selfish in their relations towards the immediate family. They are the greatest tormentors of the family; not being conscious of the extent of their ailments and ever hopeful of speedy recovery they are very impatient and never satisfied with what is done for them. Naturally the family will exert itself in every way to allay irritability.

In this connection and as a means of illustration I will briefly record two cases, whose histories will bear directly upon the points under consideration:

Case I.—Miss L., nineteen years old, one of eight children; "shopgirl" by trade. Father an elderly man, working hard to support family. This girl entered sanitarium in August, 1902. Physical examination revealed consolidation in right upper lobe anteriorly and posteriorly. Stage active. Considerable P.M. temperature. She coughs a good deal with much expectoration; lost during the summer more than 20 pounds in weight. Has night sweats. Appetite poor. Very weak. She remained under our care nearly four months. She has improved considerably both objectively and subjectively. Her temperature was about normal, she ceased to cough, felt a good deal stronger, was able to take long walks and rides without fatigue. Her local condition also showed improvement proportionately. Though the consolidated area did not resolve but there were justifiable hopes of having the disease arrested. She begged to be allowed to go home for the winter months to return in the early spring. For her benefit her parents moved from the crowded district, where she contracted the disease, to a more quiet and refined neighborhood, their house facing one of the small city parks. Believing, as we did, that the months of December, January and February, the cold winter months, would at least not retard her gained health, if not helping her along in the way of further improvement and instructing her to live in the park, to eat there, etc., I permitted her to go home. While in the city, sometime in January that year, I went to the park in the hope of finding this girl and other patients (who left the sanitarium about the same time, and who were living in the same neighborhood) there. It was a fine cold and sunny morning. To my chagrin I found none of my patients there. I called at the girl's home and found her in bed in a darkened room, though with windows facing the park. It was nearly 11 A.M. Her mother told me she did wake her and tried to persuade her to go out in the air, but she would not, "she was so tired and lazy and wanted to rest." The mother, of course, gave in.

Her appetite was again capricious and poor, and she was losing the weight she gained while in Liberty. Sometime in February, while in the city, I was asked to see her and was grieved to find that the active stage made its appearance again and disintegration of the lung had set in. They wanted my opinion as to the possibility of removing her to the sanitarium again, and I concurred with the sense of the attending physician that this move might prove fatal and advised rest in bed and await developments.

By the end of May her fever had somewhat abated, and reluctantly I have readmitted her to the sanitarium. A large suppurating cavity developed in the interim and she was in a very weak condition. Though her subjective symptoms improved somewhat, she continued to lose flesh, the cavity enlarging. She continued fairly well till October when cardiac debility made itself manifest, when I insisted upon taking her home where, in a few weeks, came the final solution.

This case illustrates fully how much harm motherly indulgence or lack of rigid discipline has done to this girl. There was plenty of nourishment, mother's care, physician's attendance and stringent instructions both by the attending physician and myself. Why such a decline and return to the worse? The change of air has undoubtedly contributed its share, but the unenforced sanitarium rules had done the most.

Case II.—Mrs. M. B., thirty-one years old; fourteen years married; three children. Youngest child five years old. Family history negative. Entered sanitarium August 12, 1902. Eight months before she started to cough. She thought she might have become infected by whooping cough from her child. Has had six attacks of hemoptysis—never to any considerable extent. Much expectoration, no pain, but only a sense of burning on the left side. No night-sweats. Lost somewhat in weight. Anemic. Temperature at 4 P.M. 99.5° F., pulse 80, weight 135 pounds. Inspection showed a fairly nourished body with slight recession on right side. Auscultation revealed consolidated area right middle lobe anteriorly and posteriorly. She too continued improving while in the sanitarium. On November 23 the following entry was made:

"Though consolidation still marked, yet there are no râles on the right lung. Left lung clear, but suspicious area posteriorly. Weight 145 pounds (gain of 10 pounds within fourteen weeks)." By this time she too had made up her

mind to go to the city. Her family lived in the Eightieth streets, having two parks at her disposal. She would certainly take good care of herself, follow strictly sanitarium régime, and I did not oppose it, as in the former case. I saw her twice during the winter months (December 1 to March 1). She seemed to hold her ground well, the only change toward the worse was that she coughed slightly more than she did while up in Liberty, but as she intended to come out in the early spring again I did not entertain any apprehensions. But she did not come out and instead lingered at home, engaged her time in light housework and care of the children and by and by fell into the old habits, ignoring all instructions and precautions. She gradually became so weak as not to be able to walk out into the air, even if she wished to do so. I did not hear from her until July 27 last, when she was brought to the sanitarium by her sister from Troy, N. Y., whither she had gone for a change of air. Her condition was appalling; pale, emaciated, pulse hardly perceptible, could not walk without assistance. She lost 30 pounds in weight. A large cavity had formed at the place where the consolidated but seemingly cicatrizing area had existed. The left lung was in catarrhal condition with high P.M. temperature. During her six weeks' stay, under the best of care and attention, she had made no progress, she was losing weight, taking little nourishment. A catarrhal laryngitis set in as a complication in the middle of September, which did not yield to treatment. Seeing the decline, I advised her to go home, as I could entertain no hope for improvement. I saw her recently with their family physician; she is going speedily down hill. Her hoarseness did not leave her; apparently a tuberculous ladyngitis developed. My prognosis was very unfavorable and had the painful mission to so inform her husband. Now, this woman was old and sensible enough to care for herself; she had the necessary means to supply her wants, but there was nobody to urge her in doing her full duty to herself and she relapsed and badly so.

The two cases cited will suffice in demonstrating how inadequate is the so-called "home treatment," even for those who have learned of the systematic ways in an institution.

The question may naturally arise, what are we to do with the unfortunate army of the poor who can't afford country life and have no means of entering special sanitariums? In answer, would say that there are contingencies and incidents in society and communities at large which somebody has to cope with, and therein lies our protest against popularizing the idea of "home treatment." Our contention is, what the nation, individual States, municipalities, philanthropists and private enterprise do with regard to other diseases (yellow fever, smallpox, diphtheria, typhoid fever, fractured bones, fibrous uteri, etc.) will do or will have to do, and in the most advantageous manner, in reference to the poor tuberculous.

Our Federal Government has established special sanitaria for the treatment of the consumptives discovered in the ranks of the Army and Navy. These sanitaria are located in the most desirable quarters, under the best of surroundings, and most gratifying results are reported.

Are not citizens at large entitled to the same consideration in the hands of their respective States and Cities? With the idea of the "new treatment" the "home treatment," before the public, our consumptives will be left to their fate or depend upon the support of kind-hearted neighbors or upon city charities—all this may bring temporary relief, but would never lead to ultimate results.

On the other hand, being impressed by the family physician, by consultants, by both medical and lay press, that only country, or better still, sanitarium life can offer a fair chance of patients' recovery, the immediate family and relatives will strain their resources to supply the necessary funds for a longer or shorter time. The public's demand for help in this direction will arouse the respective governments from apathy; philanthropists will direct their munificence into this channel, private enterprise will not linger long behind and this great want will be satisfied. Why, we have so many hospitals (State, city, of private charity, private hospitals) and so few sanitaria—and the need of them is so great! But with the idea that "home treatment" is "just as good" all efforts will be relaxed and the poor consumptives will become the innocent victims hereby.

Summary.—It is our duty to have the public at large impressed with the importance of fresh air, nourishing food and, above all, rigid supervision by physicians and nurses. These ends may be best attained by establishing sanitaria in sufficient numbers to supply the demand, and that "home treatment" as a "treatment" is not only a step backward and is meaningless, but it may prove a menace to consumptives and mislead the public mind into believing it to be a "new treatment"—and therefore this term should not appear upon the pages of our medical press.

I am pleased to report that since the above was written great efforts are being exerted in behalf of the consumptive poor, both as to prevention and cure, under the able supervision and enthusiastic management of our new Health Commissioner and medical officer, Dr. Hermann Biggs. The Riverside Sanatorium is enlarged and better accommodations are afforded the inmates.

Sites are being looked and "appropriations" hoped for the establishment of an out of town Sanatorium in the Orange or Sullivan County mountains for the treatment of incipient tuberculous cases.

Special classes for the treatment of the tuberculous are being established in connection with the city dispensaries under the supervision of physicians trained for this purpose. Trained nurses are attached to these classes, who visit

those ambulatory cases at their homes, ministering to their needs and supplying them, in case of need, with material help from special funds. From the materials of these special classes patients will be assorted and sent to the respective municipal Sanatoria. Stringent and vigorous measures are taken to suppress the spitting nuisance. The New York State Sanatorium is expected to open its doors in the coming midsummer. And so we are moving on.

1847 Madison Avenue.

THE IMPORTANCE OF DROPSY AS A SYMPTOM.*

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THE term "dropsy" is a shortening of the word "Hydropisie," meaning "watery appearance." It is applied to the presence of an *abnormal* amount of watery fluid transuded from the blood vessels or channels into the cellular tissues and lymph spaces (Gould).

The term "edema" (to swell), is used when there is a moderate surplus of water in the tissues; when excessive, it is termed "anasarca" (through the flesh), and if the serous cavities are also the seat of the transudate the condition is called "general dropsy," or the prefix "hydro-" may be attached to the cavity or part affected.

An abnormal quantity of fluid in a cavity, when unaccompanied by fever, is called a *transudate;* when due to inflammation, as indicated by fever and other symptoms of inflammation it is then called an *exudate.*

Edema or dropsy may be unilateral, bilateral, local or general. When unilateral, or local, the cause is to be found in the immediate proximity, and it always produces obstruction to the *return* circulation. When bilateral it may be due to the rare condition of a point of obstruction at corresponding parts of the two sides affected, as, for instance, thrombosis of both femorals may produce a bilateral symmetrical edema of the legs. It is the rule, however, in bilateral or general edema to find a central cause, either in the heart, kidneys, liver, lungs or blood.

The cause of *local* edema is: mechanical pressure upon the capillaries, veins or lymph spaces. It may be acute, as from an abscess; subacute, as from a rapidly growing tumor; chronic, as from lymphangitis, after operations or fracture of bones, with inclusion of some veins in the scar tissue surrounding the site of the lesion, or imperfect apposition of the parts and consequent failure to establish collateral circulation; following a phlebitis, especially of the femoral; neoplasms of any kind, particularly those affecting the lymphatic glands as these are located in chains in the flexures of the body, as in the axilla or groin, and always in close relation to the veins.

Section of a nerve, for example, the sciatic, will paralyze the arteries supplying the part, causing dilatation of the arteries and capillaries and a pouring out of more blood than the lymphatics and veins can care for, with resulting stasis and fluid accumulation (Quain).

The cause of local edema in abscess is from arterial dilatation, due to the excessive amount of blood present, as well as to the mechanical pressure offered by the pus which forms and permeates the tissues.

An important point often overlooked by the physican is the occurrence of edema of the ankles as a result of, or part of, anemia, and this condition is usually accompanied by a slight fever, irregular in type, seldom going beyond 101° or 102° F. It may simulate, or, in fact, be partly the cause of the slight fever noticed in incipient phthisis. After a severe attack of typhoid fever or other long continued toxemia, the low fever and slight malleolar dropsy that baffle all efforts to overcome may respond to a vigorous course of hematinics.

This malleolar dropsy in anemia is chiefly due to an altered composition of the blood caused by the primary disease, as in Bright's, pernicious anemia, intestinal toxemia, chronic dysentery, scurvy or any cachexia. The solid elements of the blood are here decreased, the column of blood in the vessels losing its "body," permitting a backward flow, or at least inhibiting the forward flow and putting increased work on the heart; it, in turn, being illy nourished by the poor quality and quantity of blood supplied, now acts less strongly, diminishing the *vis a tergo* and the column of blood still further stagnates, increasing the ankle edema. The tonus of the capillaries, being also lessened, adds to the condition, permitting a transudation of serum.

The skin in a *transudate* is cold, symmetrically swollen, pale, shiny and smooth, pitting on pressure and slowly resuming its former shape, or showing marks of clothing, shoes, etc., and painful only from the distention of the tissues. If the tissues are greatly distended for a considerable time there may be a rupture of the epithelium, permitting oozing of beads of clear fluid, not containing blood.

The skin in an *exudate* is hot, non-symmetrical, red, pitting on pressure which quickly disappears after the pressure is removed and constantly painful,—throbbing in character, and the skin breaks only when the abscess points, the exudate being constantly mixed with blood.

Edema of the skin, in contradistinction to a bulging, is important, in that it tells us that the fluid contents that before were non-septic, are now septic. Thus, in pleurisy with effusion there is bulging, but in empyema there is bulging *and* edema; in hydronephrosis there is bulging, but in abscess of the kidney there is bulging *and* edema; as also in an enlarged liver there is bulging but when this enlargement is due to an abscess of that viscus there is also edema of the chest wall.

Edema of the neck, including the upper thorax, or of the arm, also including the upper thorax, may be caused by aneurism or mediastinal

* Read before the Northwest Medical Society of Philadelphia, December, 1903.

growths, being gradual in onset and permanent in duration. Hydrothorax, when local, may be due to these causes, or to an enlarged right auricle pressing on the vena cava. Bilateral hydrothorax is always a part of a general dropsy. As a symptom, dropsy must always be given its full importance, for diagnosis, prognosis and treatment. It must always be considered as a pathological condition, and one which will not right itself without proper medical or surgical attention.

As a general rule, this triad can be accepted: (1) Initial dropsy of Bright's appears as edema under the lower eyelids, seen upon arising in the morning, disappearing by night; (2) in valvular heart disease, myocarditis, lung or blood conditions its first appearance is in the ankles, appearing late in the day and increasing toward night and, (3) hydroperitoneum or ascites is the first dropsy due to failure of compensation in the portal circulation, as in cirrhosis of the liver.

The local edema resulting from a small abscess is slight in importance but becomes increased in value in edema of the chest wall as indicating empyema. A slight local edema of the leg due to a lipoma pressing upon the femoral vein is as nothing compared with the edema occurring as the result of thrombosis on the same site. The onset of slight malleolar edema in emphysema tells us that the conservative development of hypertrophy of the right ventricle which coexisted has now begun to fail and that degenerative changes have advanced to a dangerous degree.

The early edema of valvular heart disease, seen in the ankles indicates also the gradual weakening of the right ventricle,—that stronghold of support in all forms of valvular heart disease,—due to fatty degeneration of the muscle. This may be present for years and not advance much until some sudden strain or intercurrent disease as bronchitis, grip or bronchopneumonia overcomes all the reserve force and the patient dies from sudden pulmonary edema.

Just so soon as we notice commencing ankle edema in heart conditions should we institute measures to check its advance,—nay, more, we should already have used our prophylactic measures to have deferred the onset of this condition.

General dropsy or anasarca, due to Bright's,—acute or chronic—or heart disease, may be recovered from if the patient be in the prime of life, possessed of good in preference to fatty muscle and the poison or factor that has caused the condition be entirely removed. A patient, however, who has once been the subject of general dropsy, regardless of the cause, is in imminent danger of a recurrence and a fatal termination.

When dropsy ensues during the course of any cachectic conditions, as tuberculosis, cancer, chronic malarial cachexia, pernicious anemia, etc., it can be inferred that the patient is nearing the last stage of the disease, the toxemia having produced the high degree of anemia present, and unless he respond to treatment, as in malaria, or have a remission in the condition as is seen in pernicious anemia, the end is not far off.

Edema of a part, after fracture or operation, is a sure indication of need of attention on our part to establish the return circulation or to remove some cause of the obstruction that is present, and this is usually best done by massage and electricity. Hydrothorax, or a pleuritic effusion, even if only moderate, must be constantly treated, medically or surgically.

This dictum may be given: Dropsy *is* an important symptom and the cause must always be sought for and removed.

So long as the effect is present the cause has not been removed and it demands intervention for the reason that the cause will become progressively active and the patient die, directly or indirectly, as the result of our lack of appreciation of this early warning. "A stitch in time saves nine."

MEDICAL PROGRESS.

MEDICINE.

Immunization against Tuberculosis.—Since the cure of tuberculosis by means of bacterial products is still a dream of the future, several attempts have been made to immunize at an early age and a great future was promised for Behring's plan of feeding infants with the milk of cows which had been treated with germs of human tuberculosis. The weak point of the method, however, lies in the fact that the milk must be employed uncooked so that the addition of formalin as preservative will be necessary. More recently Friedman has discovered that the germ causing tuberculosis in the turtle is very similar to the human germ, but absolutely innocuous even to small mammals. The injection of a large amount causes a slight febrile reaction but the animals increase in weight and if killed after months, are free from tubercles. If human bacilli are injected later, the animals remain well. Inversely, turtles may be immunized in the same way with the germs of mammals. The experiments of Moeller are based upon the same principle. According to A. GOTTSTEIN (Therap. Monatshefte, Feb., 1904) practical results are more liable to follow the method of Friedman than that of Behring.

The Relations between the Activity of Skin and Kidneys.—The value of diaphoretic treatment in diseases of the kidney has been made the subject of experiment by E. BENDIX (Deut. med. Woch., Feb. 18, 1904). He found it impossible to influence the normal freezing point of blood by the most energetic sweating procedures. It was also found that by withdrawing the water, no thickening resulted, nor did any reduction in the molecular concentration take place by the elimination in the sweat of substances dissolved in it. Both normal animals and those with kidney affections showed the same results. Observations of a similar character were also made on patients with nephritis who were treated by diaphoresis and venesection and the results were about the same as those seen in animals. When the freezing point was normal, no changes were noted after diaphoretic measures had been instituted. When the freezing point of the blood was low, however, as in chronic nephritis, the sweating raised the freezing point to almost the normal figures. The author suggests as an explanation that reserve supplies of water must be stored in the body which serve to wash out solid materials in case of necessity. In acute uremia particularly, it was found that more solid substances

were eliminated in the sweat under these circumstances than when the freezing point of the blood was about near the normal. The work shows the advisability of energetic sweating procedures in renal insufficiency as a means of restoring the freezing point of the blood to the normal figures.

The Effect of Mountain and Sea Climate on Man.—A study of this subject has been made by A. LOWY (Deut. med. Woch., Feb. 4, 1904), who finds that the test of the electrical conditions give the same results in each and the effects on the metabolism of the body are approximately the same. In high altitudes the rarity of the air is probably a minor factor, the benefits being mainly the result of the purity of the air, its constant motion and the abrupt changes from warm to cold. All of these, however, may be found at the seashore. The indications for either one or the other should be carefully examined. Where overexcitement or overstimulation is already present the patient should not be sent either to the seashore or the mountains. These places are only for those who are possessed of a reserve energy. It is not definitely known whether the climate at the seashore has the same effect on the blood as that of the mountains. He believes in the possibility, but thinks that further research is necessary to elaborate the details.

Treatment of Pyloric Stenosis with Thiosinamine.—A case in which this drug was used as a last resort, when operation had been refused, is reported by A. HARTZ (Deut. med. Woch., Feb. 25, 1904). The patient, a man of fifty-six years, had been suffering from a benign stenosis of the pyloris for thirteen years. One-half a Pravaz syringeful (=½ dr.?) of a 15-per-cent. solution of thiosinamine in alcohol was injected into the back. The symptoms began to improve and in about three months, after the thirteenth injection, the man was eating ordinary food without inconvenience. During five months he was given twenty-three injections, and was apparently cured. The reaction to the drug was marked by headache and depression in only a few instances during the early treatment. Later no unpleasant reaction followed.

Olive Oil in the Treatment of Chronic Dysentery.—The success of this treatment in chronic gall-stone disease, led to its employment in chronic dysentery and enterocolitis of tropical origin, by H. H. RUTHERFORD (Am. Med., March 12, 1904). He bases his suggestion on the analogy of these two conditions, which may seem far-fetched, but on closer consideration it is found that in chronic gall-stone disease there is frequently a hypertrophy of the liver, while in chronic dysentery there is usually a hyperemia or atrophy of the same organ. Other pathological conditions common to both diseases are also present and are due to practically the same set of causes, gastro-intestinal fermentation and absorption of the putrefaction products in the liver. About 75 cases of intractable tropical dysentery were treated about as follows: The olive oil must be pure and the author prefers that produced with especial care in California. During the first period the patient is given 30 c.c. of oil t.i.d., which is increased to 60 c.c. q.i.d. at the end of the first six days. At first nothing but milk is given, followed later by scraped beef and eggs. During the second period 90 c.c. is given three times daily, until convalescence is established and the patient regains his full weight, which may take from one to two months. During the third period the patient is allowed to get up, restored to a full diet and the oil is gradually decreased until recurrences are no longer liable. The oil may best be given at first with equal quantities of hot milk on an empty stomach about an hour before meals.

SURGERY.

Movable Kidney.—The present practice, in this condition, is not to interfere until compelled to do so by torsion of the pedicle, or some serious pathological condition. While it may be conceded that only a small percentage of patients suffering from movable kidney have obstruction of the ureter, necessitating an operation for relief, RUFUS B. HALL (Am. Jour. of Obst., Jan., 1904) believes that quite a large proportion develop hydro- or pyonephrosis, and in a few, complete obstruction. Many of these cases suffer more or less discomfort in the region of the displaced kidney. The pain, which is of a burning, dragging character, is not severe enough to necessitate an anodyne, yet is a source of great discomfort and annoyance. The pain is often constant so long as the patient is in the upright position, but is very frequently relieved by a recumbent position. Fixation gives these patients relief. The author is of the opinion that these cases should be operated upon before a hydronephrosis may develop, as the gradually increasing curvature of the ureter with its obstruction has a marked effect upon the excretory function of the kidney and may even eventually produce atrophy and cystic degeneration. The urine being unable to escape, it distends the pelvis and calices, causing destruction of the tubules and the Malpighian tufts, and terminates in a cyst, the walls of which are composed of the pelvis and the capsule of the kidney. During the acute attacks, the examination of the urine will reveal more or less pus present; but this will almost entirely disappear three or four days after the attack has subsided. Thus examination of the urine between attacks may cause a faulty diagnosis. The operation of relief of this condition, is almost devoid of danger; and, if it is performed before serious pathological changes have taken place in the organ, relief is immediate and permanent.

A Complicated Case.—A rare and interesting case is reported by T. L. COLEY (Medicine, March, 1904), of which the chief features are as follows: The patient, a man of thirty-three years, suffered from a stricture of the cardiac end of the esophagus below the diaphragm. This was the result of a corrosive esophagitis of a phlegmonous type and led to the formation of a subdiaphragmatic abscess. This communicated subsequently with the left pleura, producing an extensive empyema, which was loculated and separated the lobes of the lung. There was finally a terminal purulent peritonitis. The range of temperature and the result of the leucocyte count were atypical, which may be explained as the result of two processes,—the profound toxemia and the prolonged starvation from which the patient suffered. A number of cases have been reported of abscess following an infection from the esophagus, but the author believes that this is the only case where a subdiaphragmatic abscess was formed which subsequently ruptured into the pleura and also caused in addition a purulent peritonitis. The infection of the pleura seemed to have taken place through the lymphatics rather than to a rupture through the diaphragm, for the classical symptoms of this condition, sudden cough, extremely rapid respiration, profuse expectoration and collapse, were all wanting and the autopsy did not reveal the cause of the extension.

Substitute for Rubber Gloves.—An interesting method, which has been put to the test of practical experience, is suggested by J. B. MURPHY (Jour. Am. Med. Ass'n, March 19, 1904). He has found that a solution of gutta percha in benzine or acetone meets all the requirements of rubber gloves or the adhesive rubber dam. A solution in benzine (4 per cent.) is best for the hands and the author's technic is as follows: The hands are first scrubbed with green soap

and hot water for five to seven minutes, then washed for three minutes in alcohol, after they are thoroughly dried the rubber solution is poured on and allowed to dry without rubbing after the entire surface has been covered. The latter takes about two to three minutes and then the hands may be scrubbed in soap and water between operations, or washed with any of the antiseptic solutions. The coating will wear off the finger tips if the operations are many or prolonged, when another application may be made. The abdomen may be similarly covered before operation, but the acetone solution is preferred, as it dries in a few seconds. Murphy states that the advantages of this method are evident. There is no perspiration from the coated surface and where it wears off there is no accumulation of epithelium or secretion beneath. It is entirely impermeable and can be readily removed by washing the hands in benzine, the skin being unaffected and remaining soft and smooth.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

Agglutination Phenomena of the Staphylococci.—A contribution to this subject has lately been made by KLOPSTOCK and BOCKENHEIMER (Deut. Arch. f. klin. Chir., Vol. 72, No. 2), which is of considerable theoretical and practical value. They have attempted to show that by means of agglutination methods it may be possible to differentiate among the large number of staphylococci occurring in the air, the normal skin and healthy mucous membranes, those of a saprophytic from those of a pathogenic nature, and the conditions which may influence the production of either class. By means of cultural and immunization experiments they found that a serum derived from pathogenic cocci agglutinates not only the homologous variety but also the larger number of the other pathogenic varieties. Pathogenic staphylococci which are agglutinated by a specific serum only slightly more than by the normal serum of the same animal, are able to produce a serum which shows marked agglutinating properties not only toward the same, but also toward other varieties of pathogenic staphylococci. Saprophytic cocci are not agglutinated by a serum which is derived from pathogenic staphylococci. A serum may be produced from saprophytic staphylococci which will agglutinate other saprophytic but never pathogenic varieties when well diluted. There are, moreover, certain saprophytic staphylococci, from which it is impossible to produce a serum with agglutinating properties. The authors believe that these agglutination tests form a practical means of differentiating the pathogenic from the saprophytic staphylococci. As regards the formation of hemolysins, it was also found that only those varieties of cocci were capable of producing hemolysins which had been determined by the agglutination tests to be pathogenic in character.

Observations on Human Bile.—While the bile of animals has been very carefully investigated, few articles on human bile in various diseases, may be found in literature. T. KIMURA (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4) states that very marked variations in physical and chemical properties may occur. Thus in tuberculosis the amounts of pigment are very often low, while in congestive conditions, especially in diseases of the heart, a much darker fluid is excreted, probably since more red blood cells are disintegrated in the liver. The specific gravity varies between 1.012 and 1.04, the dry residue between 2.68 and 20.63 per cent., and the viscosity between 1.46 and 58.24. In obstructions in the common duct, the amount of pigment, dry residue and viscosity are considerably increased. Urobilinogen is found generally, urobilin less often, but in the newly-born, in marked diarrhea and where no communication exists between the biliary and intestinal systems, both substances are absent, since they are most likely of enteric origin. The normal feces also contain urobilinogen except in obstruction of the common duct.

Serodiagnosis for Identifying Blood.—The serodiagnostic method for identifying blood of man and different animals must be regarded as a most valuable procedure in legal medicine, provided the examiner is thoroughly versed in the technic. To obtain a serum which precipitates human blood G. HAUSER (Münch. med. Woch., Feb. 16, 1904) first injected placental and retroplacental blood into rabbits, but later obtained equally good results with the serum of cadavers, introduced intraperitoneally or subcutaneously twice a week in amounts of 15 to 20 c.cm. Even the serum of septic bodies remained sterile and was well borne by animals, but the blood from tuberculous cases should be avoided. If the injections are repeated too rapidly, a very potent serum will be obtained, but this will also precipitate the blood of other species; it is thus advisable to test each serum with different varieties of blood kept in stock. In legal cases a serum should be employed which, if added to human blood in a proportion of 1:30, gives rise to a turbidity, soon to be followed by a flocculent precipitate, if kept in the incubator for half an hour. Where only small quantities of blood are available for examination, capillary tubes may be used. The blood-extract is first allowed to flow in by capillary attraction, then the necessary amount of serum is sucked in and the tube sealed and set aside. If the test is positive, a ring-shaped turbidity will appear at the line of contact of the two fluids which will gradually extend along the tube. Thus performed the test is much more accurate than with the older methods. Serodiagnosis is not always necessary, for occasionally a simple microscopical examination will suffice to determine that a blood is not human, as where only nucleated red cells are found.

Notes on Blood-coagulation.—There is no longer any doubt that the blood platelets play a most important part in the coagulation of blood, for P. MORAWITZ (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4) has succeeded in isolating them from the other elements in the blood and has been able to determine that they contain a large amount of thrombogen. The other cells lack this substance, so that there is every reason to believe that the platelets are not derived from the disintegration of erythrocytes or leucocytes, but form an independent group. A small amount of thrombokinase may also be detected, but the bulk of this substance comes from the leucocytes. In extravascular clotting, small nodules often form along the walls of the vessel just prior to clotting; these consist almost entirely of platelets. The number of platelets in the blood also seems to stand in some relation to the rapidity of coagulation. Further experiments are in progress to determine if thrombogen and thrombokinase may be employed therapeutically, perhaps in conjunction with adrenalin in severe hemorrhage. One great difficulty lies in the fact that kinase is an extremely labile body, but a permanent preparation may be obtained by evaporating and drying in vacuum. By dissolving in water shortly before use, a very potent solution results.

Vincent's Angina.—The peculiar membrane and ulcerations in the throat characteristic of Vincent's angina, seem to be due to a long, spindle-shaped bacillus with slight mobility and numerous lighter areas in its body, and an actively motile spirillum, since both generally occur in pure culture upon the surface. The bacillus has also been found in other lesions, as in a sublingual abscess, submaxillary adenitis, in the pus of

empyema and in hospital gangrene. It may even be found in the mouth in conditions of perfect health. Clinically the disease is very mild, with only slight fever and moderate swelling of the glands, but there are cases on record complicated by polymorphous exanthemata, synovial effusions and pleuritis, probably due to secondary infection. Not rarely a stomatitis goes hand in hand with the angina. Locally two forms may be recognized: in one, a tonsil is covered by a grayish-white membrane which leaves a superficial raw surface when cast off; in the second the membrane is thinner but the ulceration deeper. In the great majority of cases the affection is unilateral and smoking seems to be an important etiological factor. The differential diagnosis is occasionally difficult, since the ulcers may closely simulate diphtheria or primary or secondary syphilis. What complicates matters, is that the germs in question may occasionally grow upon these ulcerations as harmless saprophytes, but they are then generally mixed with other organisms. All attempts at cultivation have hitherto been unsuccessful, though if contaminated with other bacteria, it is sometimes possible to obtain a growth on serum media for two generations. A. GROSS (Deutsch. Arch. f. klin. Med., Vol. 79, Nos. 3 and 4) has had occasion to examine the infiltrated tissues microscopically; he found the inflammation fibrinous in character, with many bacilli, almost in pure culture in the superficial layers and a much smaller number in the deeper tissues. Spirilla were also found but are of less importance, since abundant on healthy mucous membrane. Though the chain of evidence is not complete, there is every reason to believe that the bacilli are the cause of the ulcers.

NEUROLOGY AND PSYCHIATRY.

Micropsia and Macropsia.—The word "micropsia," according to O. VERAGUTH (Deut. Zeitsch. f. Nervenheilk., Nov. 10, 1903) signifies a qualitative disturbance of sight, in which the individual sees things lying in his field of vision smaller or farther removed than they really are. Macropsia or megalopsia is the opposite condition. Both phenomena appear in various diseases of the nervous system. Five cases were reported by Charcot; they were tabes complicated with hysteria, traumatic hysteroneurasthenia, tabes and hysteria in which there was monocular micropsia and polyopsia, hysterical degeneration, and a case marked by hysterical crises. Various authors have recognized these conditions among the aura of epilepsy. The author reports four cases as follows: (1) In a case of undoubted epilepsy, macropsia occurred as a phenomenon of petit mal. (2) A case, probably of nuclear origin, of metasyphilitic type or associated with nutritive disturbances in the medulla as the result of arteriosclerosis, presented micro- and macropsia associated with dyschromatopsia. (3) A case of typical hysteria presented a monocular micropsia and dyschromatopsia and followed by temporary amblyopia. (4) A patient in whom an occasional micropia associated with abnormal sensations of movement appeared, was an example of a neurosis of exhaustion with hereditary taint. In concluding, the author finds that micropsia and macropsia occur in hysteria, epileptic aura, petit mal, psychoses exhaustion of nervous energy (neurasthenia), tic convulsif and probably in organic diseases of the nuclei of the motor nerves of the eyeball. These symptoms are of no pathognomonic value. They may be isolated or associated with other disturbances of vision and may be localized in one eye.

Abdominal Symptom-complex in Diseases of the Lower Part of the Dorsal Cord.—The increasing importance of abdominal pain as a significant symptom in local and remote pathological conditions, imparts a peculiar value to the observations on the above subject by H. OPPENHEIM (Deut. Zeitsch. f. Nervenheilk., Nov. 10, 1903). Diseases of the lower part of the dorsal cord between the levels of the eighth and twelfth dorsal roots produce a charactertistic complex of root and cord symptoms. This is particularly typical in affections that gradually develop and that encroach upon the cord from the outside, as in the case of neoplasms. In these cases there are found unilateral pain following the distribution of the nerve-roots, diminished or totally absent reflexes in the domain of the abdominal musculature of the corresponding side, degenerative paresis of the muscles, paresthesia or anesthesia in the areas of the distribution of the eighth and ninth, or tenth and eleventh or of all four roots. In Brown-Séquard's symptom-complex pain and disturbances of reflexes precede the other symptoms, but this order is not a constant one. In most cases of this disease thermo-anesthesia of the opposite side is the first manifestation, still it is sometimes preceded by homolateral spasm or paralysis. Also characteristic is the transition from the hemilateral to the bilateral symptom-complex (girdle-sensation) bilateral areflexia, anesthesia paralysis, meteorism, paraplegia, etc. One must be cautious in making the diagnosis of a local condition from these symptoms. Simple or spastic non-atrophic paralysis of the abdominal muscles may be produced by conditions higher up in the cord. Moreover, in the healthy and in cases of intra-abdominal disease, there may sometimes be found differences in bone and muscular strength between both sides of the abdomen. The abdominal reflexes, moreover, are inconstant ones, their failure even not necessarily indicating a pathological condition. These reflexes are frequently affected in cases of intercosto-abdominal neuralgia and neuralgias of the viscera.

Case of Hystero-epileptic Chorea.—For more than a century articular rheumatism has been held to be a cause of chorea minor, says GIOVANNI MORELLI (Gazz. degli osped., Feb. 21, 1904). In 1887 various forms of streptococci were found in three cases of polyarticular rheumatism. Many experimentors have found proof of an infection. Since then many writers have claimed the infective origin of chorea, and articular rheumatism accompanying or preceding chorea is generally admitted. Sydenham's chorea has been observed following many other infectious diseases not associated with rheumatism. Chorea develops suddenly after violent emotions, trauma, syphilis and in cerebral lesions. It is not rare in pregnancy. Rheumatism may be only one of many causes. Heredity is of the greatest importance. Every age of life has its own peculiar diseases. In infancy and the period of early development, eclampsia, epilepsy, infantile paralysis, chorea, and certain other nervous diseases are seen. This is due to the physiology of the brain, which from the period of birth to puberty is changing and in a condition rendering it liable to various disturbances. The writer reports a case of a boy suffering from chorea with heredity, age and previous rheumatic infection, the muscular contractions affecting the face, neck, tongue, limbs, pharynx and heart. Muscular fatigue did not appear as in ordinary chorea. Abolition of the pharyngeal reflex, cutaneous hyperesthesia and dermographia suggested hysteria; in addition increased reflexes, painful areas in abdomen and back, easy suggestibility, and the quieting of the tremor under the influence of a command still further demonstrated hysteria. In addition to these symptoms, a form of epilepsy was present, of the ambulatory type, automatism, amnesia, and occasional convulsions. Mentally the patient was depressed, and at times suicidal. The

conclusion drawn from a study of this case is that a marked affinity exists between epilepsy, hysteria and chorea.

A Few Remarks upon Stuttering.—Although stammering has been regarded as almost always a manifestation of some neurosis, yet, according to O. MAAS (Deut. Zeitsch. f. Nervenheilk., Nov. 10, 1903) in a greater proportion of cases than yet realized, it is in all probability to be attributed to local organic changes in the central nervous system and even in the peripheral nerves. The symptoms of organic stuttering are not yet well understood. Possibly deviation of the tongue will turn out to be one, and possibly symptoms will be found in the area of distribution of the facial nerve.

PHYSIOLOGY.

A Study of the Antagonistic Action of Poisons.—A contribution to this subject has been made by T. SOLLMAN (Am. Jour. of Physiol., Feb. 1, 1904) in studying the simultaneous action of pilocarpine and atropine in the developing embryos of the sea-urchin and starfish. A. P. Matthews had found that the development of the latter is hastened by pilocarpine and retarded by atropine. The advantage of studying the effect of the simultaneous action of the two drugs in these simple organisms in which the effect is a plain one and can be easily observed, is apparent. The author found that while small doses of pilocarpine hasten the developments of the embryos, larger doses or a prolongation of the action, produce the opposite result. Small doses of atropine have no effect, but larger doses hinder development. When both drugs are used, there may be antagonism or synergism, according to the conditions; but the depressant action always tends to predominate. The observed resultant is always below the mathematical average. Even with the best antagonism, both poisons are producing their action, as shown, for instance, by the greater liability of the protoplasm to depression. Stimulation can be readily and completely removed by very small doses of a depressant (even by doses which are inactive when used alone). Depression is lessened by only a limited range of doses of the stimulant. Its removal is in no case complete. This gives to stimulation a limited but distinct usefulness. The optimum dose of the stimulant is smaller when the embryos are depressed than when they are normal. Larger doses are synergistic to the depressant, and hence harmful. The dose of the stimulant must therefore be chosen smaller, when depression exists, than in normal specimens.

The Action of Radium Rays.—A series of chemico-physiological experiments were performed by G. SCHWARZ (Pflüger's Archiv, Dec. 17, 1903) on hen's eggs, with the view of elucidating some of the important problems that have arisen in the therapeutic application of the Becquerel rays. In 1900 Walkhoff observed certain peculiar changes in the skin caused by radio-active substances, which are analogous to the dermatitis produced by the Roentgen rays. Becquerel noticed in his own case, that carrying a highly active radium preparation in his vest-pocket produced a deep and persistent inflammation in the skin beneath, which spread and terminated in a deep-seated abscess. The repetition of this observation by others has led to the term "radiogenic inflammation." The therapeutic application of this radio-active substance rivals that of the Roentgen rays in tuberculous and carcinomatous disease of the skin. No explanation of the effect of the former on normal and pathological tissues has been forthcoming, except that it consists of a primary cellular degeneration with secondary reactive inflammation. This peculiar necrobiotic change in the cells following an exposure to the rays sometimes of not more than five minutes, not immediately, but only after a latent period of several days, has awakened investigation. Gresel observed that paper in which radium has been kept becomes brown and brittle, and ascribed these changes to molecular attraction which he assumes by analogy to take place also in living tissues. These and other researches stimulated the author to study the physiologico-chemical effects of radium rays, and for this purpose he availed himself of that veritable store-house of chemical and physiological facts, the hen's egg. Exposure of the latter to the influence of radium rays for 44 to 144 hours produced, in the sense of a dry distillation, a decomposition of the albuminoids. No marked changes are produced in native albumin. The organic pigment, lutein, a lipochrom contained in the yolk is decolorized. There is an important electric action in the lecithin, which is decomposed. This substance, allied to the fats, contains nitrogen in the group cholin, which is bound to the phosphoric acid constituent, and by virtue of its nitrogenous content is revealed its derivation from albumin. Its decomposition takes place with the addition of water and results in the formation of stearic acid, glycero-phosphoric acid and cholin, which last splits off trimethylamin. According to Verworn, lecithin is a splitting-product of albumin, like the nucleins, with which it is associated. It is a necessary constituent of all living cells, being united in some unknown way with the albumin of the protoplasm. According to Hoppe-Seyler, the presence of lecithin in large quantity in developing cells or in those capable of development, associated with cholesterin in the yolk of the egg, spermatozoa, colorless blood-corpuscles, rapidly-growing pathological growths and in many seeds and rapidly-growing parts of plants, indicates that lecithin bears a certain relationship to the metabolic events of cellular development. The influence of radium in decomposing lecithin would seem to explain the peculiar effects wrought by this substance in the cutaneous and adjacent tissues. The continual exfoliation and regeneration of the epidermis requires the presence of a considerable quantity of lecithin in accordance with the rule that this substance is found in largest amounts in those tissues undergoing active development. The necrotic and inflammatory changes in the skin produced by radium can therefore be explained upon the basis of the loss of lecithin through decomposition. The action of the Roentgen rays in retarding or arresting the growth of carcinoma and lupus of the skin would therefore be accounted for by this fact namely, that the lecithin which is abundant in all neoplasms and evidently plays an important rôle in their growth and development, is destroyed by prolonged exposure to the influence of these radiations.

The Effect of Various Essences on the Cerebral Circulation.—In experimenting with the essence of absinthe and with the essential oils of anis, citron, melissa and canella, A. D'ORMEA (Arch. Ital. de Biol., Nov. 21, 1903) found that when injected into the circulation in a dose not capable of producing convulsions, these substances have the following effects on the circulation of the brain: A more or less rapid and durable depression of the circulation in the circle of Willis, associated with a rise of the subarachnoid pressure. Anis and citron produce the mildest effects while melissa and canella act more powerfully and sometimes even in small doses produce convulsive seizures. Camphor produces a still stronger effect, which may include a general convulsion frequently resembling in form and intensity, that caused by essence of absinthe.

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DIRECT HEART MASSAGE.

THE recent announcement by Dr. W. W. Keen, of Philadelphia, that direct massage of the heart, after an opening has been made through the diaphragm, might prove life saving in certain serious cases of apparently fatal collapse in abdominal operations when the patient is under an anesthetic will not prove so surprising to the medical profession generally, as it apparently was to the public, from the space given it by the newspapers.

For some time it has been understood that direct heart massage might accomplish a very definite life saving purpose in these extremely annoying and unfortunate cases. In recent years it has been the custom of Prof. Richet, of the University of Paris, to demonstrate in his course on physiology the possibility of apparently restoring dogs to life by the method of exposing their hearts and intermittently squeezing them with the hand. Animals that had been drowned and were to all intents and purposes dead are thus brought back to life. If the heart massage were not instituted in these cases the animals would never breathe again. As it is, though the heart-beat and respiration have ceased and the animals have been for over three minutes under water, after a time the heart begins to beat again, under the irritation of the massage and with the aid of artificial respiration; complete restoration to life follows.

Even before Professor Richet's experiments and demonstrations there had been more than a suspicion that irritation of the heart muscle itself might lead to revival after apparent death. Certain of the measures used in the production of artificial respiration and recommended for application after persons have been rescued from the water in an unconscious condition, seem to take advantage of this principle. It was recommended, for instance, that firm pressure should be made over the thorax anteriorly with intervals of relaxation. In asphyxiated newborn children intermittent pressure upon the thorax has always been considered an important part of revival methods. Even the ordinary artificial respiration, as conducted in the laboratory under forced air pressure, on an intubated animal, has something of this same principle in it. The alternate expansion and contraction of the thorax, under forced air pressure, acts as an irritant to the heart by alternately pressing the lungs against it, and then allowing them to contract away from it.

From this, of course, to actual incision of the diaphragm and the taking of the heart of the human being in the hand for purposes of massage is a long step. It is, however, one that has been gradually led up to, as have most of the practical discoveries in medicine and surgery, and there seems no doubt of its entire justification under the serious circumstances in which it is recommended. It is not attempted until the patient has been for at least five minutes without active respiration. To all intents and purposes such a patient is dead and the added risk of entry to the thorax through the diaphragm is therefore completely justified. That such a procedure may be successful, Dr. Keen's own reported case is the best proof. Notwithstanding that more than five minutes had passed since the heart had ceased to beat, under massage it resumed its pulsation, and though the patient died about half an hour later, there is no doubt that a new chance for complete recovery had been given, and only for the patient's cachectic condition, the case was one of total laryngectomy for cancer, the new life opportunity thus afforded would not have been in vain.

How long after apparent death such a procedure may be employed with some hope of success it is yet difficult to say. Great encourage-

ment, even after many minutes have passed, is afforded by certain experiments, which were undertaken in order to obtain additional physiological data for the procedure. The hearts of animals after removal from the bodies had been frozen for over two days and yet were made to renew their pulsations or at least make a certain number of spontaneous contractions and relaxations as the result of well-directed massage. It would seem then that this procedure might well find a place in attempts to restore to consciousness those who have been under water for some time, whenever all other methods of resuscitation have failed and the patient is about to be given up for dead.

It has never been absolutely decided how long after the patient has been under water, death is inevitable. In animals five minutes usually sealed their fate until this new procedure added to the means of resuscitation. In human beings occasionally resuscitation has been accomplished by previously accepted methods, even after twenty minutes, though the cases are rare and those of longer immersion with subsequent resuscitation are not well authenticated.

It is perfectly possible that this new method, which has been employed altogether over twenty-five times now and in two of them with such complete success as to restore apparently dead patients to life, may prove a very important addition to modern surgical therapeutics. At best, however, it will have a very limited field of application. It is more the sensation produced by the unusualness of the procedure of actually handling the heart in order to irritate it into renewed contraction than its possible frequent usefulness that brings it so prominently before the public now. It is but the further step in the surgery of the heart that has been developing in recent years from the first successful case of suture of the organ after injury, until now when even serious incised wounds, of the left ventricle particularly, are not likely to prove fatal if the surgeon recognizes the condition and has the courage to treat it by such direct surgical methods as he would apply to any other incised muscle.

"A FLORIDA ENCHANTMENT."

FLORIDA has long been celebrated for her oranges, but if the inhabitants of her rural districts, with their antiquated and bucolic habits, still continue to measure their faith by the traditional Biblical standard, their grains of mustard seed must have increased to even a greater extent than the rest of their tropical fruits. At all events, Mrs. Helen Wilman-Post has been reaping a golden harvest, and might, it seems, have still been making daily bank deposits of large sums had she not, like Bonaparte, met with a Waterloo, and also, like Bonaparte, encountered it in an unexpected manner and from most ignoble hands.

According to the evidence produced at Jacksonville, Mrs. Post was a "healer," not only of large experience, but of even greater promise, for the list of the miracles which she guaranteed to accomplish by her mental treatment comprised the following acts: "To get a man out of jail; make a new set of teeth grow; make a leg grow on a stump from which the lower leg had been amputated; make the hair grow on a bald head; restore the affections of persons who had become estranged, ensure success in speculation, transfer the affections of persons."

Now the wants of the human kind are very much the same the world over, whether they live in an ordinary every day manner, in huts bordering on the sluggish Wilhlacooche river, or if they reside in a Sunday-like, holiday way, in brown stone houses that are washed by the receding tide of the Atlantic, in the "Back Bay" precincts of classic Boston. Moreover, there are not many ordinary beings who would not be assisted by the materialization of some of these promised benefits. While there are very few who unless possessed of a carping and discontented spirit would not have been satisfied with the list as originally given. In order, however, to insure perfect satisfaction to those desirous of obtaining her professional services, Mrs. Post issued a second circular of approved medical "stunts" which was to the first what the dress white tie is to the evening coat of civilization. These were: "To insure the birth of children; to check the undue size of families, and to regulate the sex of future offspring." This having been accomplished, the Florida Enchantress rested from her labors. Her web had been woven. It was of steel wire, copper fastened and clinched, and she did not believe that a fly from any ointment could escape its meshes.

The weeks rolled by, and the money rolled in, bills of large amount, notes of small denomination, but always money. Teeth were reported to be growing in gums long smoothed by age. Convicts were released as their terms expired; delicate rootlets of hair were believed to be germinating in polished scalps, and all went merry as a marriage bell. The offices grew and extended, the

number of clerks who were sending glad tidings of great joy to all manner of men and women, increased, and printed answers to the questions of eager inquirers were now beginning to flood the mails. Then ensued a plethoric golden age, in which unbounded success relaxed the caution that had hitherto kept the machine in motion. It appeared at the trial that Mrs. Post no longer read her mail, but after extracting the enclosed money entrusted the answering of the letters to clerks, who either forwarded printed circulars, couched in glittering generalities or consigned them unacknowledged to the yawning void of waste-paper baskets. The complaints began to increase and multiply, and with the charge of "using the United States Mail to defraud various persons" came the bursting of the South Sea bubble in the sandy dunes of Florida.

There is a moral in all true tales, and the saddest part of the mishap of this modern "Belle Helene" lies in the fact, that she has never recognized the little acorn of discontent from which the great oak of ruin, that gradually overshadowed her prosperity, grew. Nor did she know the wood-woman, who not only would not spare the tree but whose feeble fingers first laid the glittering axe at the roots of her affluent success. Somewhere down in Citrus County, in the interior of the State, there lived a woman, one Mrs. Casey, who not only had been wooed, but according to her "marriage lines" had also been won by the most selectman of the selectmen of her native town. From then on her life seemed marked with success. Endowed with great executive ability, and possessed of a lively interest in the affairs of others, she for years sat at the right hand of her selectman, from whence, according to her neighbors, she came to judge both the quick and the dead. The one weak spot in her heart was for her pet dog, towards which her fancy, after the manner of her sex gently, turned to thoughts of love. The New England spinster of uncertain age may devote herself to her tabby, of an equal uncertain sex, while the up-to-date American girl, since the Spanish war, will waste her sweetness on the unresponsive marmoset and the changeable chameleon, but with the women of the South a yellow dog it has always been, and a yellow dog it will always be 'till suns shall rise and set no more.

Unfortunately Mrs. Casey's particular specimen was either a truant dog that thought his home a cage, or he was possessed of a desire to wander from his own fireside that could not be eradicated. At all events he departed from home and mother on a certain sultry day, and she refusing to rest under the consoling thought that it was better to have loved and lost, started after him in an equally sultry pursuit. Both the woman and the dog became engrossed in the match and were utterly unconscious of the fact that it was taking place between the yellow pine rails of a local freight line until an engine coming round a curve met the lady full and fair in the midst of herself and her career. What appeared in the local papers was merely an announcement of the escape of the dog, coupled with the bald and bare statement, that Mrs. Casey had been "hurt some." The "some" referred to being a compound comminuted fracture of the arm and a loss of the left leg just above the knee. The locomotive was an alien, an imported stranger, but it seems to have done its work thoroughly, as the limb, which was buried with the full rites of the church, proved conclusively that it had not bitten off more than it was perfectly able to chew.

Years passed and the wounds had healed, but Mrs. Casey never smiled again or ceased to repine that in all the things she was not "as other women are." It was not that the taunts of ribald boys, with their scoffing allusions to "peg leg" and "dot and carry one" broke her proud bearing, nor yet her inability to join in the merry dance, but rather a personal sense of a loss of equilibrium, and a constant desire to reestablish, on the old lines, the accustomed meta-centric balance of gravity. She might, like the centurion of old, say to one "come," and to another "go," but as long as she was personally unable to supervise the execution of her commands, the exercise of her almost despotic power found but little favor in her eyes. It was at this critical period that the illusive and flamboyant circular of Mrs. Post fell into the outstretched hands of Mrs. Casey, and the beginning of the end had come. But oh, what rapture; as to love she had it, as to teeth she was indifferent, bald she was not, but how doubly blessed was the "healer" who could make even one leg grow where one had grown before. The farm was mortgaged and the proceeds sent to Jacksonville. Day followed day, and the faith in the efficacy of the cure waxed and waned with the tides and the moon. The instructions were implicitly followed out, but the leg that she had looked for never came.

There is a trite injunction fed to each baby with his mother's milk, in the cattle raising districts of the South, "Never give a bullock sul-

phur or you will repent it," and to this may be added, never feed a "cracker" woman "taffy," or fail to keep a contract with her paid for in advance. For from selectman to selectman the story of Mrs. Casey's wrongs traversed the hummocks and bayous of her native State, and from postmaster to postmaster spread the news of the sinful pulling of her leg. Then came the power and might of an outraged government, with its illegally-used mails, and the career of Mrs. Helen Wilman-Post was at an end.

The interest from a scientific standpoint lies in the fact, that this case directly confutes the allegations of these "Mental Healers" who claim that their failures, in all cases, are due to a want of faith on the part of those treated. For here *was* faith, and faith to spare. Faith that could not only move mountains, but faith that attempted to move Mrs. Casey, who was equally as massive, and perhaps a little more inert.

THE LONG BACILLUS OF THE STOMACH CONTENTS.

THE long bacillus, which is so constantly found in the stomach contents in cases of carcinoma, has attracted the attention of many investigators. It was first discovered by De Bary, Jr., who named the organism *Bacillus geniculatus,* but failed to attach any special significance to its presence. Minkowski pointed out its predominance in bacillus fermentation associated with extensive production of lactic and butyric acids. Boas then drew attention to the importance of the long bacilli in the differential diagnosis of cancer of the stomach, and showed that their demonstration may be regarded as collateral evidence of the presence of lactic acid. The first description in greater detail came from Oppler. Since then it has been spoken of as the Boas-Oppler bacillus. The clinical significance of this organism, as first formulated by Boas, has now been definitely established. Instances, it is true, have been recorded in which the bacillus has been encountered in non-cancerous affections of the stomach, but such occurrences are after all rare and do not detract materially from their diagnostic importance. This is practically the same as that attaching to the presence of lactic acid.

The question why these organisms should occur so plentifully in carcinomatous stomachs has long been a subject of speculation. Possibilities which suggested themselves were (*a*) the anacidity of the gastric juice with simultaneous stagnation of the stomach contents; (*b*) the irregular contours and depressions of the surface of the tumors, and (*c*) the admixture of blood to the stomach contents. Each one of these factors no doubt is of moment.

A perfectly satisfactory explanation of the reasons why in advanced cases of the disease the long bacilli control the situation to the exclusion of almost all other forms has, however, not been furnished until recently. Sandberg's researches, which appeared a short while ago, have thrown new light on this problem. Using one per cent. glucose agar this investigator succeeded in isolating two types of the organism in question from carcinomatous stomach contents. One of these was represented by short bacilli, the other by the typical long bacilli. Their identity was proven by the demonstration that one type could artificially be caused to pass over into the second type. The short type the author regards as the primary form. Associated with these two types carcinomatous stomach contents may contain one or more other forms of lactic acid producing bacilli, and it is interesting to note that on artificial media these forms develop much more rapidly and readily than the long bacilli, although in the stomach contents they are far less numerous. Their acid production, corresponding to the greater activity of their growth on artificial media is also much greater. These peculiar results find their explanation in the fact that while the acid production of the common lactic acid bacillus is at first much more active than in the case of the long bacillus its growth is arrested already by a comparatively low percentage of lactic acid. The growth of the long bacillus, on the other hand, is thus rendered more vigorous. This was shown in a series of ingeniously arranged experiments. Sandberg prepared an artificial culture medium, which represented the patient's own gastric juice, sterilized by means of chloroform, to which glucose was further added. Tubes of this medium were then inoculated with the two types of the long bacillus and the common lactic acid producers which had previously been isolated. In one experiment, in which the medium contained 1.9-1,000 of lactic acid, it was found that the two types of the long bacillus had grown very actively, while in the remaining tubes no growth had taken place. In the presence of 3-1,000 of lactic acid the long bacillus did not grow so readily as in the first experiment, while the other tubes again remained sterile. In a third experiment in which the stomach contents contained 14-1,000 no growth even of the long bacillus occurred.

The appearance of the long bacillus in almost pure culture, in cases of carcinoma, thus finds its explanation in the resistance which the organism offers to lactic acid in concentrations, which will arrest the growth of the common lactic acid producers. These latter probably furnish the primary grade of acidity, which is especially favorable to the growth of the long bacilli.

Opposed to the validity of the above explanation is apparently the fact that isolated cases of carcinoma have been observed in which the long bacillus was present even though lactic acid could not be demonstrated at the time. In such cases it is possible that the bacteria may have developed in nooks and crevices of the carcinomatous portion of the stomach, where conditions favorable to their growth may have been present, even though the gastric contents as a whole may not have proved a suitable medium. This factor, as we have pointed out, has already been suggested as of moment in the explanation of the predominence of the long bacillus in carcinomatous stomachs. That such a condition should favor the occurrence of fermentative processes even in the absence of stagnation of the stomach contents is scarcely to be doubted, and probably also accounts for the frequency with which certain protozoa (*Trichomonas intestinalis, Megastoma entericum*, etc.) are simultaneously encountered.

MARAGLIANO'S VACCINATION.

THE name of Jenner has become synonymous with savior. In those days when medical textbooks described smallpox as an inherent humor which must out in every man, and where it was the prevailing opinion that as no one could escape it, it was better to have it and be done with it, in those days we can see that it must have been hard indeed to have established the use of such an unprecedented custom as vaccination.

Until the last few years of the nineteenth century, the popular view of tuberculosis has been almost as fatalistic. But from Koch to Maragliano there has been an uninterrupted procession of investigators who have marched forward with careful haste; and have carried the flag of conquest almost into the citadel of death.

If tuberculosis can be as completely controlled as smallpox has been, the greatest curse of disease will be lifted from the land. In the original contribution of this week, prepared by Prof. Edoardo Maragliano, of Genoa, Italy, and read at the Henry Phipps Institute on last Monday night, we see that it is possible to produce a specific serumtherapy for tuberculosis, and that there is good reason to hope for vaccination in man as a preventive of the spread of the disease.

It all depends upon the enterprise with which Prof. Maragliano's methods are tested upon a large scale, whether it is a half-century or but a few short years before the value of his and his colleagues' work is felt all over the civilized world.

The energy and wisdom shown in the adoption of antitoxin of diphtheria has illustrated what can be done, when laboratories, health departments and great business institutions work together on an approved scientific basis. The bacilli of diphtheria work with such lightning rapidity that the rescue from the disease is almost spectacular; and the public has needed but little coercion to adopt the treatment. Also the onslaught of the disease is so decisive that there is no time to waver and doubt. But the slow, insidious progress of tuberculosis and the tendency to delay diagnosis until the serumtherapy will prove of no avail will combine to make the public doubt the efficacy as well as the necessity of such treatment as well as of vaccination.

Dr. Maragliano begs for a wide test, which implies years of work, but such work is just the kind that the generous founder of the Henry Phipps Institute had in mind. Means, equipment, workers, leisure, and a great desire to bring things to pass, are all necessary if one would establish the machinery that will make a scientific theory lift a part of the world's burden. These the Institute possesses as no other in the world. And it would seem as though it were best fitted to carry out the charge.

We feel that if the workers of the Henry Phipps Institute satisfy themselves that these methods are practical for application on a large scale, it will not be too much to expect that they will indicate the lines by which the serum shall be manufactured, and distributed, and also undertake the propaganda of the treatment with the systematic cooperation of health departments.

Bacteriology of Conjunctivitis of Measles.—In the majority of cases of measles examined by E. SCHOTTELIUS (Münch. med. Woch., March 1, 1904) the *Staphylococcus aureus* was found in the conjunctival secretion, less frequently the other varieties of staphylococci and in especially severe cases, streptococci. These did not correspond exactly to the ordinary pyogenic streptococci, as they did not grow below 30° C. and behaved somewhat differently toward aniline dyes. When examined in the dried state, they often appeared as diplococci, but the hanging drop showed distinct chain formation. The findings point to a possible pyogenic infection as cause of measles.

ECHOES AND NEWS.

NEW YORK.

Hospital Appointments.—The following men from the College of Physicians and Surgeons have secured hospital positions: Bellevue—C. K. Stillman, first place; W. C. Cramp, J. T. Pilcher, J. F. Bowman. Mt. Sinai—A. E. Cohn, Max Taschman, J. J. Meyer, Louis Jacobs, S. Wiener. German Hospital of Brooklyn—B. S. Harris. Bridgeport (Conn.) Hospital—C. H. Sprague.

Civil Service Examinations for the State and County Service.—The State Civil Service Commission announces general examinations to be held April 19, 1904, including physicians in State hospitals and institutions of both regular and homeopathic schools. Applications for these examinations must be made on or before April 14. Full particulars of the examinations and blank applications may be obtained by addressing the Chief Examiner of the Commission at Albany.

Physicians and Surgeons Announcement.—The annual announcement of the College of Physicians and Surgeons has just been issued. It is a pamphlet of sixty-four pages. Two new names appear among the officers of instruction: Dr. Harry McMahon Painter, professor of clinical obstetrics, and Dr. Gorham Bacon, clinical professor of otology. The following new appointments have been made: William K. Simpson, clinical professor of laryngology; Philip H. Hiss, adjunct professor of bacteriology; Eugene Hodenpyl, adjunct professor of pathological anatomy; Francis Carter Wood, adjunct professor of clinical pathology, and Frederick R. Bailey, adjunct professor of normal histology. New courses will be offered in the departments of materia medica, pharmacology and therapeutics, of pediatrics and of physiological chemistry. More extensive work than ever before will be given in pharmacology and therapeutics under the direction of Prof. Christian A. Herter, and considerable attention has already been directed toward the development of a thorough pharmaceutical laboratory, under the care of Drs. Jelliffe and Bastedo. The work in general chemistry, heretofore given under the direction of the Columbia University department of chemistry, in the future will be in the hands of Professor Gies, head of the department of physiological chemistry at the Medical School. Three courses will be offered in general organic, inorganic, and physical chemistry in addition to the regular work in physiological, toxicological, and botanical chemistry.

Hospitals at Their Fullest.—The current issue of *Charities* says that "a census of all the municipal hospitals and the general private hospitals of New York shows that the unusual number of patients has been continued very steadily through the winter, and that the total number of patients in twenty hospitals on March 19 was greater than on January 23. On the former date the total was 5,202, and on the latter 5,390. As the capacity of the hospitals is given as 5,446, there are now, on paper, only fifty-six vacant beds in all the general hospitals of New York. As a matter of fact, the distribution of vacancies makes the condition look much better than at first appears. In the city and metropolitan hospitals, conducted by the Department of Public Charities, there are 200 more patients than the capacity. In Bellevue and allied hospitals, patients and capacity are about even. In the private hospitals there are at least a few vacancies in each, and in some a fair number. The condition in the city and metropolitan hospitals has been held to be the naturally expected result of a very severe winter. These two hospitals are the places of last resort for the sick poor, and the sick poor are more exposed to and suffer more from the rigors of such a winter as the one just passed than any other class. Hence the crowding on the island hospitals. Another factor out of the usual is the fact that for three weeks preceding the date of removal to its new buildings, Mt. Sinai Hospital refused to accept any patients, so that on March 19, when this census was taken, there were only 28 patients left in the old building and none in the new. Undoubtedly this raised the numbers in other hospitals. The average number of patients at Mt. Sinai from January to March was 205 daily. Changes in the children's ward at the Presbyterian Hospital also made a difference, as a part of this ward was temporarily closed in January. It appears, therefore, that conditions now are really worse than in January when there was the most talk and newspaper comment on the congested condition. But the hospitals have met the tax on their resources and, except in the municipal hospitals on the East River islands, are in good shape to deal with the epidemic of grip and pneumonia. It was stated at a number of them that with the real opening up of spring and warm weather the number of patients may be expected very materially to decrease."

New York Academy of Medicine.—The next meeting of the Pediatric Section will be before the whole Academy on April 7, 1904, at 8:15 P.M. Following is the program: 1. Modes of Infection in Tuberculosis, by Philip S. Sabine, M.D.; 2. Infantile Tuberculosis, its port of entry, topography and clinical manifestations, by Rowland Godfrey Freeman, M.D.; 3. The Influence of Bovine Tuberculosis on Human Health, by Mazyk P. Ravenel, M.D., of Philadelphia; 4. The Prevention of Tuberculosis in Children, by Hermann M. Biggs, M.D.; 5. Discussion of the Papers, by Dr. Thomas Darlington, Commissioner of Health; Drs. W. P. Northrup, Emmett L. Holt, C. N. Dowd, S. M. Hamill, of Philadelphia, and others.

Prof. Lefferts' Farewell Lecture.—On Monday, March 28, Professor George M. Lefferts gave his farewell address to the clinical assistants and Class of 1904 at the Vanderbilt Clinic. The pit was very tastefully decorated and three larges vases were filled with roses and placed on the speaker's table. Upon the Professor's entry into the room the audience arose in a body and applauded for nearly five minutes. Following this, George Lathrop, President of the Senior Class at the College of Physicians and Surgeons, presented a costly loving cup in behalf of the students and spoke very tactfully and feelingly of the regard in which Dr. Lefferts has so long been held by generations of medical students. Dr. W. K. Simpson, who will succeed Dr. Lefferts as professor of laryngology, then arose and in a fitting speech presented a loving cup in behalf of the clinical assistants. In accepting the gifts Prof. Lefferts said that doubtless popularity has its advantages, but it also has its disadvantages, for now he too would be obliged to make a speech, but in anticipation of their demands upon him he had come forearmed (withdrawing a manuscript from his pocket). He had learned to know the method, manner and meaning of medical students' applause through his long years of teaching and felt that he could interpret rightly their very kind feelings on this present solemn occasion. For thirty years he has engaged himself in active teaching of laryngology, and when he began nobody elected his course because it seemed of so little practical value to the general practitioner. His

was the first clinic of the kind in New York and the third in the whole United States. In May, 1876, he was made a full Professor with the power to organize and control the clinical work of the department. So well has this been done that the Class of 1900 offered to the Faculty the opinion that his clinic was the best systematized and best adapted for medical teaching of any in the college. By a vote of the Faculty and Trustees of Columbia he has been made Professor Emeritus and it is his hope that his administration will be accepted by all men as able, dignified and honorable. His entire collection of teaching apparatus has been presented to the Trustees "for the benefit and free use of coming generations of medical students." All this he said in no spirit of vain self-glorification, but the love for his clinic has grown with the years and of this he speaks not of himself. In addressing Dr. Simpson he said that he believed him to be earnest and devoted to the work which he has carried on at Vanderbilt Clinic for seventeen years. It is not so much the matter or subject that one has to present as his manner of presenting it, and in offering this advice he wished his successor Godspeed. All the members of Prof. Lefferts' family were present, including the nurses who had served him so long, and the exercises made a deep impression upon them as well as upon the general audience.

PHILADELPHIA.

New Society Against Tuberculosis.—The delegates called to meet in Philadelphia to consider the founding of a national society against tuberculosis were entertained at dinner on the evening of March 28 by Dr. L. F. Flick. Abstracts of the address that was to have been delivered by Professor Maragliano, who was detained by illness, were distributed. The meeting held afterward was presided over by Dr. William Osler. After some discussion it was decided to found a National Society for the Prevention of Tuberculosis. An executive committee consisting of Drs. Trudeau, Biggs, Flick, Welch and Sternberg, with the chairman and secretary of the meeting as members *ex officio*, was appointed. This committee is to have full charge of arrangements for perfecting the new organization, including election of officers, etc. It was the sense of the meeting that the new society have no affiliation with either of the so-called International Congresses on Tuberculosis now under way in this country. The name of this new society is the United States Society for the Study of Tuberculosis. The President is Dr. William Osler; Secretary, Dr. Henry B. Jacobs. The committee of five was appointed to plan a permanent organization to be effected at the meeting of the American Medical Association at Atlantic City in June.

Philadelphia Hospital Examination.—At a conference between the Mayor and the deans of the various medical colleges it has been decided to hold the examination of candidates for internes at the Philadelphia Hospital on May 10. The Mayor will appoint the members of the examining board who, it is stated, will have no affiliation with any of the medical colleges. There are 19 vacancies to be filled, and it is said that if 19 women get the highest marks they will be appointed.

Attempts to Form Nose Unsuccessful.—Two attempts have been made by Dr. Charles H. Frazier, at the University hospital, to form a nose for a young man who lacks that organ. Each time the patient has spoiled the results of the operation and it is said that further attempts may not be feasible. The fourth finger of the patient's hand was fastened to the desired place but the pain of keeping the arm in the necessary cramped position was too great for the patient who each time tore the finger loose.

To Enforce Vaccination.—A bill giving the Department of Health power to enforce vaccination is to be introduced into the next legislature. The only compulsory vaccination law now in force in Pennsylvania is that relating to school children, although vaccination may be made partially compulsory in cities of the second and third class.

American Society of Tropical Medicine.—At a meeting of this society held March 21, Dr. W. M. L. Coplin exhibited specimens illustrating diseases of the tropics, including dysentery, abscess of liver, leprosy and uncinariasis. Dr. McConnell exhibited for Dr. Joseph McFarland some specimens of the Leishman-Donovan blood parasite, through the courtesy of Sir Patrick Manson, an honorary member of the society. Dr. J. M. Swan showed for Dr. Allen J. Smith gross specimens of the *Hymenolipsis nana*. Election of officers for 1904 resulted as follows: President, Dr. Thomas H. Fenton; Vice-Presidents, Dr. J. J. Kinyoun, Dr. James M. Anders, Dr. Alfred Hand, Jr.; Secretary, Dr. Joseph McFarland; Assistant Secretary, Dr. John M. Swan. The Councilors for the year are Drs. Roland G. Curtin, Judson Daland, John V. Shoemaker, Allen J. Smith and W. M. L. Coplin.

Filters to Lower Typhoid Rate.—Chief Hill, of the Filtration Bureau, from a statistical investigation of the cases in the city at present says that when the filtration is completed the typhoid rate will be lowered at least 80 per cent. This is based on the comparison of cases for the past eleven weeks in the Twenty-first and Twenty-second wards, which have filtered water, with those in the remainder of the city. In the former the weekly average for each 100,000 of population was 3.7 cases; in the latter it varied in different localities from 10.4 to 13.8 cases. The present epidemic is not abating.

Cerebral Form of Grip.—Physicians report as epidemic a form of the grip that in its first stages is difficult to differentiate from meningitis. There were 8 deaths from the disease last week. It is estimated that 8,000 persons are now under treatment for the disease in its various forms.

Anniversary Dinner.—The anniversary dinner of the Henry Phipps Institute was given by the Staff at the University Club on Monday evening, March 28. The delegates to the convention, which was called to consider the question of forming a National Organization for the Study of Tuberculosis, were all invited as guests of the occasion. Sixty-two persons were present, among whom were many of the most eminent physicians of the United States. The feature of the evening was the presentation of a silver pitcher to Dr. Lawrence F. Flick, the Director of the Henry Phipps Institute, by the members of the Staff, as a token of their esteem. Mr. Henry Phipps, the founder of the Institute, was present, and made the presentation in the name of the Staff. Among those who spoke after dinner were Dr. Abraham Jacobi, of New York; Dr. William H. Welch, of Johns Hopkins University; Dr. Vincent Y. Bowditch, of Boston; Dr. John M. Prior; Dr. Charles L. Minor, of Asheville, N. C.; Dr. George M. Sternberg, former Surgeon-General of the Army; Dr. John B. Huber, of New York; Dr. Ward, of Albany, N. Y.; Dr. Henry B. Holton, of Brattleboro, Vt.; Dr. John Musser and Dr. James Tyson, of University of Pennsylvania, and Dr. J. C. Wilson, of Jefferson Medical

College. Dr. L. F. Flick acted as toastmaster and chairman, and Dr. M. P. Ravenel spoke for the Staff of the Henry Phipps Institute.

CHICAGO.

Chicago Medical Society Endorses Emergency Hospital.—This Society, at its March 16 meeting, endorsed the project of the Iroquois Memorial Association to erect an emergency hospital in the business section of the city, and the following resolutions were unanimously adopted: *Resolved*, That this Society approves and unqualifiedly endorses the action of the Board of Trustees of the Iroquois Memorial Emergency Hospital in their generous effort to give to the people of Chicago a modern, fully equipped and endowed hospital, capable of rendering prompt assistance to those cases of unexpected injury and sickness, which are of daily occurrence, and be it further resolved, that we, as a Society, tender to the hospital our counsel, advice, and professional services whenever required.

Necessity for Iroquois Memorial Hospital.—According to Commissioner of Health Reynolds, necessity for such a hospital may be inferred from the following statement of cases handled by the police of the district north of Harrison street during 1903: Number of casualties, 734; number found unconscious, 56. These cases were all removed to hospitals by the police, and the total does not include fully 10 per cent. more injured persons removed to their homes, many of whom were severe cases, who should have been taken to a hospital but for the distance. Nine of the 790 cases died en route to the County Hospital, an average distance of more than two miles from where they were injured, over rough, ill-paved streets. Those found unconscious were chiefly persons suffering from fracture of the skull or from poison; some of these died who might have recovered with prompt hospital care. Another class found unconscious, which especially needs the medical skill of experts, embraces cases of coma, the result of disease, and not from alcohol, which latter it closely resembles in its symptoms. A downtown emergency hospital, thoroughly equipped, is a necessity.

Medical and Dental Professions Unite on Questions of Legislation.—The Chicago Medical Society and the organized dental profession agree that all questions of legislation and larger public policy relating to medical and dental affairs shall be referred to a committee, to be known as the Committee on Public Relations. This Committee is to consist of ten members, five from each profession. It shall have a Chairman and a Secretary. Any question of public policy or public relation affecting either the medical or dental profession, or of legislation affecting directly or indirectly either of them, can be referred to this Committee. It will be the duty of the Committee to carefully consider these questions. It will have the power to recommend either specific action or general attitude to the societies from which the members come as delegates. There shall be an annual meeting of the Committee at which organization shall be effected and continued. Other than this the meetings shall be special, and can be called by the President or by any two members. The officers shall be elected for one year. The method of election of the delegates and the length of their service shall be regulated by the societies which they represent.

Sarcoma of the Hip Joint.—Dr. Wagner demonstrated before the North Branch of the Chicago Medical Society a patient upon whom he had performed a hip-joint amputation for sarcoma five years ago, with absolutely no signs of recurrence. The patient was fifty-five years of age; the picture of health, and weighs more now than at any period of his life. The stump, a solid, heavy upholstering of good muscular tissue, shows the scar of the incision very favorably situated, namely, so high anteriorly that when the patient is seated on a chair it is far removed from any pressure. This method of operation shows the great advantage of the use of long vulsellum forceps inserted in both flaps to the number of three or four as forceful hemostats, as well as their superiority to retractors. Inasmuch as the latter may slip, tear, and through their insertion and reinsertion mutilate the tissues and increase hemorrhage, hemorrhage is avoided or fully controlled by the forceps mentioned above. They facilitate greatly the manipulation of the flaps; after their insertion, large compresses are placed between the flaps, and then by means of dovetailing the forceps steady compression for a short time is exerted. This insures absolute hemostasis. The flaps are then slowly and gradually separated, the blood vessels caught with small hemostats just as they appear on the small exposed area, etc., until all the blood vessels are within the grasp of the hemostats which renders the operation almost bloodless. This procedure is preceded by ligating the femoral artery. For closing the wound a silk suture, guarded with rubber tubing, was employed. The author frequently uses this suture material for uniting the flabby abdominal walls, and it was used in this case with great satisfaction. Microphotographs made by Dr. Herzog from the specimen which had been dissected out of the tumor several weeks previous to the operation confirmed the diagnosis of sarcoma, and in which Prof. Nicholas Senn, Dr. Daniel R. Brower, and Dr. Wagner concurred. Dr. Wagner reported three additional cases.

Penal Hypospadia.—The patient, fourteen years of age, was operated on two months ago. The same method as Carl Beck described in the *New York Medical Journal* for 1898 for balanitic hypospadias was resorted to, namely, two lateral incisions from each side of the median line along the sulcus corona glandis, fusing in an incision following the urethra towards the scrotum, 2½ inches in distance, were made. The urethra was dissected out, and then pulled through the opening which was established by running a double edged knife through the glans penis in the direction which the normal urethra takes, and the distal part of the urethra, after being pulled out through this opening, was sutured with catgut to the external opening of this new canal. The wound edges of the flaps were then united, followed by primary union. After the lapse of fourteen days the new opening contracted, which necessitated splitting of the meatus and suturing. By means of the daily use of a sound the meatus has remained satisfactorily patent. It is interesting to note that during the healing period there was no inflammatory reaction from the urine passing over the wound. Furthermore, the patient did not experience any pain, not even during the first day. The use of a constricting rubber tube rendered the operation bloodless.

Extirpation of Metacarpal Bones.—Extirpation of the second, third, and fourth metacarpal bones (after loss of three fingers and crushing injury to the metacarpal bones with great defect of integument, volar as well as dorsal) with perfect functional result. This result was obtained by careful dissection and saving of the adductor pollicis and digitii minimi muscles

and the branches of the median and ulnar nerves which constitute the nerve supply for the muscles in question. At first, the fingers were in a paralytic condition, as one might expect, but by daily massage and the application of electricity by the author himself the patient (the hand has the appearance of a lobster-shears) has full use of the fingers which were affected and is now able to earn his own livelihood through caligraphy with this hand, and has also become an expert performer on the zither.

Radical Mastoid Operation.—Dr. Wm. L. Ballenger showed a young woman, aged sixteen years, who, about nine years ago, was vaccinated. The vaccination was followed by a discharge from the left ear, and as far as could be learned, it was the cause of the ear trouble. Four years ago she came under his observation, was treated by conservative methods for a year and a half, with only temporary relief. Three years ago he did a radical mastoid operation, finding cholesteatomatous masses in the middle ear and mastoid cavity, with suppuration, caries, and perforation in the middle fossa of the skull. There was marked meningeal irritation. The operation afforded relief, but subsequently there was necrosis in the mastoid portion of the wound, which necessitated a second operation. A few days following the second operation he resorted to Thiersch grafting in the mastoid portion, and a week or two later did a Thiersch graft in the middle ear cavity. At present the middle ear as well as the mastoid is completely lined with healthy skin. The case was interesting on account of the Fallopian canal being exposed, showing plainly the location of the facial nerve. The Eustachian tube was likewise visible through the mastoid wound. There only remained a little suppuration within the Eustachian tube. He expected to close the tube later, and having done it, the mastoid wound would be closed by a plastic operation, and the speaker hoped that with paraffin injections he would be able to avoid much deformity The patient is entirely well and has been since last October.

Left Bronchial Fistula.—Dr. Allen B. Kanavel reported a case of left bronchial fistula in a child of seven years, which has been present since birth. It is located at the most common site—within an inch of the sternoclavicular junction, and passes directly upwards towards the upper border of the hyoid bone. It cannot be followed farther, although when it fills up, as it does at times, any manipulation of the tract gives rise to a coughing attack. There is no cervical auricle, but the tract is marked by a firm band of tissue which is probably connective tissue. The other members of the family show no evidence of any congenital anomaly, with the exception of a brother who has hydrocephalus.

Coccygeal Sinus.—Dr. Kanavel demonstrated a second case of coccygeal sinus which was operated upon under the diagnosis of anal fistula. Upon operation, a large mass of hair and epithelial débris was found the size of a walnut, and the history was elicited that although the patient had suffered within the last year from an acute attack simulating an ischiorectal abscess, and this discharging sinus had been very marked since, still he had noticed a constant moisture and slight irritation for a number of years previously. The fistula was in the median line and about half an inch below the tip of the coccyx.

Some Notes on the Therapeutics of Tonsillitis.—At the March meeting of the Chicago Pediatric Society, Dr. J. Scott Brown, in a paper on this subject, after dismissing the subject of chronic tonsillitis with the remark that he considers a large percentage of the cases to be of the rheumatic type, and that he treats them locally and systemically with tincture ferri chloridi, the formalin and formalin iodine sprays, and Seiler's solution used as a douche for the nose and throat mentioned below, took up the treatment of acute tonsillitis, making special mention of the follicular variety. His routine treatment for such cases, basing dosage on the adult, is: Calomel, ¼ gr. every half hour, until six doses.

℞ Tr. aconite root..... gtt. ⅕
Tr. bryonia..... gtt. 1/10
Tr. belladonnæ..... gtt. 1/10
Red iodide of mercury..... gr. 1/100

In each tablet, given one per hour until eight per day are taken.

Quinine tablets, each gr. 1, are given every hour until eight are taken.

Alcohol and water, as a gargle is employed, t.i.d.

℞ Formalin (40 per cent. sol.)..... ♏ iii
Glycerini..... ʒ ii
M. et add
Aquæ, q.s. ad..... ʒ i
M. Sig.: Spray throat, t.i.d., between gargle.

And

℞ Formalin..... ♏ iii
Glycerini..... ʒ vi
M. et add
Tr. iodine..... ♏ xx
M. et add
Alcoholis..... ʒ iv
Aquæ, q.s. ad..... ʒ iv
M. Sig.: Use as a spray following immediately the last spray.

He says that part of the treatment is empirical, but that he finds his cases, even with temperature of 102° or 103° F., can generally return to their usual avocations in about forty-eight hours, and cited illustrative cases.

Undescended Testicle.—The third case reported by Dr. Kanavel was one of undescended testicle on the left side. The testicle lies in the inguinal canal and has not changed its position for a number of years, and has given rise to no trouble until about a year ago, when, after a severe strain, a mass developed suddenly at the same site, followed almost immediately by a sickening pain characteristic of that usually experienced when a blow is received on the testicle. This was accompanied by vomiting. All symptoms would disappear as suddenly as they came on, when the mass was replaced in the abdomen. Repeated attacks of this nature helped to make the diagnosis of congenital hernia; the symptom was due to pressure from the distended cyst.

GENERAL.

Bubonic Plague in Peru.—United States Minister Dudley cabled the State Department from Lima on March 25 that bubonic plague had broken out in San Pedro, Callao, and Lima.

War on Mosquitoes in South America.—An active campaign against the spread of yellow fever and malaria, by an organized war against mosquitoes, has been started at Guayaquil, Ecuador, as the result of suggestions of Dr. Gruver, the resident officer of the United States Marine Hospital Service.

Medical Library and Historical Journal.—The first number of the new year of the *Medical Library and Historical Journal* has just arrived. It is an extremely attractive publication and merits the attention of the entire medical public. Dr. James J. Walsh has a most able article on the Popes and their relation to the his-

tory of anatomy, in which he shows that the Popes were not so greatly opposed to the study of anatomy, as some writers have affirmed. Dr. William Osler contributes an interesting account of the "Phthisiologia" of Richard Morton, and Dr. Isadore Dyer has an instructive study of the origin of the Louisiana leprosy. A short history of Winslow, and a brief paper on Medicine in Its Relation to Human Progress are other papers in this number.

Johns Hopkins University.—The medical department has announced the first course of lectures on the Herter Foundation. Prof. Paul Ehrlich, M.D., LL.D., director of the Royal Prussian Institute of Experimental Therapeutics, Frankfort-on-the-Main, will lecture in German, April 12, 13 and 14, on subjects related to immunity.

American Academy of Medicine.—The Twenty-ninth Annual Meeting of the American Academy of Medicine will be held at the Shelburne, Atlantic City, beginning on Saturday, June 4, at 11 A.M., and continuing through to Monday, June 6. The program includes: 1. The report of the Council on the recommendation of a paper read at the last meeting by Dr. H. Bert Ellis, of California, on "The Necessity for a National Bureau of Medicine and Foods." 2. The report of the committee to investigate the teaching of Hygiene in our public schools. In order that this report may be discussed intelligently, the committee will publish the laws relating to the teaching of hygiene now in force in the United States, in the Bulletin of the American Academy of Medicine, to be published in April, 1904. It is believed this is the most complete and accurate compilation of these laws published, and the only compilation issued in an easily accessible and low priced publication. (Any number of the Bulletin will be sent to any address upon receipt of 50 cents.) 3. The reports on the results of the examinations before the various State Boards of Medical Examiners of 1903. 4. A Symposium on the Relation of Physicians to Dentists and Pharmacists. Several papers of value are promised for this Symposium and the subsequent general discussion will be helpful. 5. A Symposium on—Are Modern School Methods in Keeping with Physiologic Knowledge? There is probably no subject of general interest that should be directed by the medical profession, of more importance than this. Apart from the papers promised, arrangements are being made for a discussion opening up the whole subject from various points of view. 6. In addition to the above, there will be several papers upon independent topics, affording a variety to the program.

Massachusetts Medical Society.—At its meeting on March 23, 1904, the Massachusetts Medical Society, Suffolk District, Section for Obstetrics and Diseases of Women, elected Dr. Daniel H. Craig as its President. On March 24, after presenting a paper for their consideration, Dr. Craig was given an Honorary Membership in the New Hampshire Surgical Club, at its Semi-annual Session, held at Concord, N. H.

Pathological Exhibit at the St. Louis World's Fair.—There will be a pathological exhibit at the World's Fair in St. Louis under the auspices of the American Medical Association. The exhibit, which will be held in the Palace of Education in a gallery over the east main entrance, will be of wide scope, covering the field of general pathology and bacteriology. The President of the Association has appointed the following Exhibit Committee to take charge of the work: Executive members: Ludwig Hektoen, Chicago; A. J. Ochsner, Chicago; W. A. Evans, Chicago; W. T. Eckley, Chicago; L. F. Barker, Chicago. District members: J. N. Hurty, World's Fair; Frank F. Wynn, Indianapolis; Max Herzog, Philippine Islands; V. C. Vaughan, Ann Arbor; W. W. Keen, Philadelphia; J. S. Billings, Jr., New York; Philip King Brown, San Francisco; Ellsworth Smith, Jr., St. Louis; Allen J. Smith, Philadelphia; F. W. Farham, New Orleans; R. M. O'Reilly, U. S. Surgeon-General. Dr. Ellsworth Smith, Jr., who has charge of the St. Louis district, has appointed the following Advisory Committee to assist him in the organization of an exhibit for his district: Drs. Y. H. Bond, H. W. Bond, John Young Brown, B. Meade Bolton, Willard Bartlett, N. B. Carson, O. H. Elbrecht, W. E. Fischel, B. M. Bypes, Bransford Lewis, H. W. Loeb, Robert Leudeking, B. G. Mudd, Henry Schwarz, Chas. Shattinger, J. H. Simon, C. A. Snodgrass, Justin Steer, Hugo Summa, Robert Terry, E. F. Tiedemann and H. Tuholske.

American Institute of Physical Culture.—Jay W. Seaver, M.D., Medical Examiner at Yale University Gymnasium, President of the Chautauqua School of Physical Culture, President of the American Institute of Physical Culture of Boston, and the highest authority on Anthropometry, addressed the physicians of Boston and vicinity, at the rooms of the Institute, 29 Beacon Street, Boston, Mass., on Saturday, March 26. "Exercise," said Dr. Seaver, "may not only be classified as one of the necessities of life, like food and air, but it may be looked upon as a therapeutic means of very high value. Exercise may be divided into two general classes, as active and passive, the first being made up of movements that are directed by the central nervous system, consisting of such movements of the various parts as cause a complete flexion and extension of the joints with the consequent stretching of the muscles that would ordinarily produce these joint movements; and second, the muscles may be subjected to mechanical pressures and kneadings that will stimulate the circulation of both blood and lymph, and produce nutritive changes that are quite similar to those set up by active exercise. These passive movements have been grouped under the term massage. A combination of active and passive movements may be used at times with advantage, the attendant resisting the active movements of muscles in a more or less vigorous manner according to the condition of the muscles that are being treated. The abnormal conditions that are best treated by exercises are those of the nervous system where there is a tendency to inertia and explosive action. The normal working of the motor portions of the brain with the attendant activities of large sensory tracts will treat the entire nervous system by one of those fundamental processes that is so essential to vitality and to the smooth or well coordinated functions of the brain. The utilization of nerve force through these normal channels will usually prevent the explosive action of the nervous system along abnormal lines. One sees a good illustration of this in the restful sleep that follows a hard day's work of physical activity, and the opposite effect in the restless, fitful sleep where the day's work has been of an intellectual character and accompanied by no physical activity that has, so to speak, called the brain back to its fundamental processes."

American Association of Pathologists and Bacteriologists.—This association held its fourth annual meeting in New York on April 1 and 2. A report of the Proceedings will be found in a subsequent issue of the MEDICAL NEWS.

Tenth International Congress of Ophthalmology in Lucerne.—In compliance with the request of numerous foreign colleagues, the date of the Congress has been changed. The official reception of members will now take place in the evening of September 13; the mornings and afternoons of September 14, 15 and

16 will be devoted to scientific work, and on September 17 an excursion will bring the Congress to a close. Those colleagues wishing to secure accommodation at Lucerne beforehand, are advised to apply, before September 1, to Dr. F. Stocker, president of the local Committee at Lucerne. He will engage for them rooms at one of the best hotels (early breakfast included), at 5 francs a day each person.

American Neurological Association.—This association has fixed the time of its meeting at St. Louis for September 15, 16 and 17; and this will be immediately followed by the sessions of the various medical departments of the Congress of Arts and Sciences, beginning September 19.

Seventh Annual Meeting of the American Gastro-enterological Association.—This society will meet at Haddon Hall, Atlantic City, N. J., June 6 and 7, 1904. The program will consist of a Symposium on Gastric Ulcer, to be participated in as follows: Introduction, J. C. Hemmeter, of Baltimore, Md.; Bibliography, Charles D. Aaron, of Detroit, Mich.; Pathologic Anatomy, Harlow Brooks, of New York; Pathogenesis, W. G. McCallum, of Baltimore, Md.; Incidence of Gastric Ulcer in the United States, Campbell Howard, of Baltimore, Md.; Gastric Ulcer in Children, E. G. Cutler, of Boston, Mass.; Symptomatology and Course, Max Einhorn, of New York; Atypical Forms, G. W. McCaskey, of Fort Wayne, Ind.; Complications and Sequelæ, M. Manges, of New York; Conditions of Blood and Urine, T. Futcher, of Baltimore, Md.; Differential Diagnosis, H. W. Bettman, of Cincinnati, Ohio; Further Remarks on the use of Orthoform in the Diagnosis of Gastric Ulcer, F. H. Murdoch, of Pittsburg, Pa.; Medical Treatment, S. W. Lambert, of New York; Surgical Treatment, Joseph A. Blake, of New York; Classification of Gastric Ulceration and Hemorrhage, Report of Case of Perforating Angiosclerotic Gastric Ulcer, A. L. Benedict, of Buffalo, N. Y.

OBITUARY.

Dr. JOHN METCALFE POLK died of pneumonia at the home of his parents, 7 East Thirty-sixth Street, on Tuesday, March 29, at 1.30 A.M. He was the son of Dr. William M. Polk, Dean of the Cornell University Medical College, in New York City, and grandson of Bishop Leonidas Polk, of Tennessee, Lieut. General in the Confederate Army. He was born May 6, 1875, and was graduated from the Sheffield Scientific School of Yale University, receiving the degree of Ph.B. in 1896. He was one of the prominent men in his class and a member of the Delta Psi Fraternity. In the following year he began the study of medicine and was graduated from the Cornell University Medical College in 1899, second in his class. From January, 1900, until January, 1902, he served as interne on the Second Medical Division of Bellevue Hospital, and during the following year took a postgraduate course abroad, chiefly in Vienna. On returning to this city in December, 1902, he was immediately appointed one of the instructors in the Medical College from which he received his M.D. degree and at the time of his death was Instructor in Medicine and in Physical Diagnosis. Last fall his industry, his thorough training and his remarkable clinical abilities won him the position of Adjunct Assistant Physician in Bellevue Hospital. Dr. Polk was a man of attractive personality, unusual force of character and of great promise. During the past winter he had been conducting some experimental work upon the hemolytic action of the blood in infectious disease which his co-laborers in the laboratory considered of remarkable value. This had practically been completed when he was taken ill, and it is earnestly hoped that the results interrupted by his death may be collected and published. The loss of so fine a man will be greatly felt by the profession at large, and particularly by the faculty and students of the Medical College; and the large circle of those who know and so highly esteem his father will feel the keenest sympathy with his parents in their great sorrow.

Dr. DAVID MCKAY died in Dallas, Tex., on Wednesday last. He was born in Glasgow, Scotland, in 1832, served on a British warship as surgeon in the Crimean war, settled in New York, and in 1861 enlisted in the Seventy-ninth New York Volunteers. Six years ago he was made surgeon general of the Grand Army of the Republic.

Dr. A. B. ARNOLD, for many years well known in Baltimore, is dead at San Francisco. He was graduated in medicine at Jefferson College and was professor of nervous diseases at the Baltimore College of Physicians and Surgeons from 1876 to 1898, when he went to California. He wrote much for medical and literary magazines.

Dr. GEORGE H. BUTLER, of this city, died last week in the sixty-second year of his age. He was graduated from the Bellevue Medical College in 1869, and was a member of many medical societies, including the Medical Society of the County of New York, the New York Physicians' Mutual Aid Association, the New York Academy of Medicine, and the New York Chemists' Association.

Dr. C. M. GARRISON died in Salt Lake City, on last Saturday from cerebral meningitis. Before going to Utah, twelve years ago, Dr. Garrison practised his profession in New York City.

Dr. ALFRED DUPERIER died last week at New Iberia, La., the town that his father founded over a century ago. Dr. Duperier was born there in 1826, and was graduated from the University of Michigan. He was an earnest Whig of old, remained a Union man during the Civil War and advised with Lincoln and Sumner about Louisiana affairs. He rendered effective service in the yellow fever epidemics of 1853 and 1867 in southwest Louisiana.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, March 12.

THE CRUSADE AGAINST CONSUMPTION—THE VENTILATION OF THE HOUSE OF COMMONS—DOCTORS IN PARLIAMENT—A MINISTER OF HEALTH.

ON March 10 the annual general meeting of members of the National Association for the Prevention of Consumption and other forms of Tuberculosis was held under the presidency of the Earl of Derby. There was a very scanty attendance. Reference was made in a previous letter to the prevalence of consumption among Post Office employees here. Some of your readers may therefore be interested to know that at the meeting in question it was announced that the Postmaster-General has sanctioned the organization of an effort to raise a fund sufficient for the endowment of 100 beds for employees suffering from consumption. The beds to be endowed are in the Sanatoria erected by the National Committee for patients who, though not well-to-do, are able to contribute something toward the cost of their maintenance and treatment. The fund for the purpose is to be raised by periodical stoppages of pay. The report of the Council showed that the Association is, financially speaking, in a bad way. Indeed the Honorary Treasurer, Mr. Malcolm Morris, stated that if

public support is not forthcoming to a much larger extent than has hitherto been the case, the Association must before long, as Carlyle would have put it, "deliquesce." The report further stated that during the past five years the Council had made strenuous efforts to induce medical officers of health throughout the country to impress on their authorities the advantages likely to follow the adoption of a system of voluntary notification of phthisis. A Select Committee of the House of Commons recently sanctioned a corporation by-law for Sheffield, in which notification of tuberculosis of the lungs is made compulsory on every registered medical practitioner called upon to visit any person suffering from such disease. As to the isolation of consumptive cases in workhouses and asylums, steps have been taken by a few boards of guardians in Great Britain to deal with the question. Considerable progress in the erection of sanatoria has been made during the year, and a new edition of the list of such institutions published by the Association shows that there are now some 70 institutions in the United Kingdom, making a total of 2,760 beds. This is an increase of 18 institutions and 375 beds over the return in October, 1902. The majority of these institutions are, however, for private paying patients, and the need of providing accommodation for the poor consumptive is still extremely urgent. There are at the present time 935 members of the Central Association, and 2,900 of the branches, making a total of 3,835. There are now in the United Kingdom 20 branches of the Association and five kindred associations. During the year new branches were formed at Hereford and the Aberystwith University, which has constituted itself into a separate branch of the West Wales Branch. At the present time a sanatorium for 60 beds is rapidly approaching completion at Winsley, with 40 free beds and 20 beds at an average charge of about 6s. a week. Glasgow is raising funds for the provision of a sanatorium; the West Wales Branch has obtained a site and is appealing for funds; the Leeds Association has a sanatorium for 30 beds; the Devon and Cornwall Branch have started their sanatorium at Didworthy; and the Cumberland Branch has procured a site to build a sanatorium; Paisley and one or two other centers are taking measures to provide sanatoria. In addition to the branches in the United Kingdom, colonial branches or kindred associations have been formed in Canada, Victoria, New South Wales, South Australia, Natal and Cape Colony.

For many years past constant complaints have been made by our legislators of the foul atmosphere in which they have to do their work in the House of Commons. Several committees have been appointed to investigate the causes of the evil and to suggest a remedy. Counsel has been sought of architectural, engineering, sanitary and medical oracles, and large sums of public money have been expended, but the House of Commons has still the reputation of being one of the worst ventilated buildings in His Britannic Majesty's dominions on which the sun never sets (and in some parts of which it hardly ever rises). The air in the House swarms with bacilli of the most ferocious species, and in the state of diminished resistance caused in Members by the vitiated atmosphere in which they discharge their legislative functions, these invisible enemies of the human race find them an easy prey. Some years ago the House was almost decimated by influenza. Is it surprising in the circumstances that our politicians waste their time in interminable wrangles which lead to nothing; if in their speeches Ministers temper ineptitude with irritability, and if the leaders of the Opposition seem to suffer from intellectual asphyxia? The mental state of the House, once called by John Bright the august Mother of Parliaments, may often fairly be described in the words in which the author of the *Dunciad* sings the final triumph of dulness

"And universal darkness covers all."

There is now promise of a better state of things. Various measures suggested by a Select Committee which sat a few months ago are to be adopted. A new ventilating plant is to be installed forthwith. A tunnel which runs from the Chamber to the terrace on the river Thames will serve to harbor a monster fan, driven by a 30-h.p. electric motor. This fan will suck in the fresh air from the terrace, but before reaching the House the air will pass through iron frames covered with the finest copper gauze, and will be cleansed of all impurities by water sprays constantly playing upon the metal mesh. On foggy days the air will probably be passed through cotton wool—a method stated to be remarkably effective in purifying the atmosphere. Before reaching the House the air will be heated and delivered through the perforated stall-boards and a large grating covered with open-work matting in the center of the Chamber. It is estimated that 50,000 cubic feet of air can be introduced per minute. It may be hoped that the effects of an improved ventilation may soon manifest themselves in better legislation. The method of dealing with fog might perhaps find a wider application than was dreamed of by the Select Committee. Poor Oscar Wilde, in one of his plays, expressed a doubt whether it was the fogs that caused the serious people or the serious people that caused the fogs. Seriousness—or to give it its right name, dulness—is so prevalent in our Parliament that its normal condition is to be enveloped in a dense fog. If means could only be devised by which the speeches of most of the Members could be passed through thick layers of cotton wool, a political reform such as it has not entered the mind of any statesman to conceive would be accomplished!

There is a feeling among practitioners of medicine here that both Parliament and the profession would be all the better if the House of Commons contained a larger number of medical members. At present it has scarcely half a dozen, and not one of these can be looked upon as a representative of the great body of general practitioners. It would unquestionably be a good thing for the nation if Parliament had the benefit of the expert knowledge that medical men can bring to the consideration of questions of public health. There are, however, difficulties in the way which are not fully appreciated by the profession. A doctor would have no chance of being elected by any constituency to which he offered himself as such rather than as a politician. In nearly every constituency there is an element—greater in some and less in others—of the foolish hostility to medical men and the science of which they are the hierophants, which appears to be a characteristic of modern democracy. Again, the position of a Member of the British Parliament is one that necessarily involves considerable expense. A contested election costs anything from $3,000 to $10,000. Then every place looks to the M.P. who has the privilege of being its representative to subscribe not only to all the local charities but to the football, cricket, lawn tennis, hockey and other clubs whose name is Legion. A friend estimates that in addition to the extra expenditure caused by the necessity of living a good part of the year in London it costs him about $2,500 a year to represent a small borough. Members for large cities and for counties have to pay a much heavier price for helping to make the laws of a not always grateful country. There are not many men in our ranks who could afford so expensive a luxury as a seat in the House of Com-

mons, and there are practically none in the active practice of their profession who could spare the time required for the proper discharge of senatorial duties. If a medical man takes to politics he is virtually compelled to give up his profession. A suggestion that the British Medical Association should supply the funds required to secure the election of one or two doctors and contribute to their expenses while in the House has found some favor among a certain section of the profession. It is doubtful, however, whether the Association could find the money for such a purpose, and it is almost certain that, even if funds were forthcoming, it could not find the right kind of men. If the sort of person who makes himself most conspicuous as a medical reformer among us were to be sent to Parliament as, even indirectly, a "Member for Medicine," he would simply bring the profession into general contempt.

A step that will help to make the influence of the few medical men who are now Members of the House of Commons more effective was taken on March 8, when a Committee of Public Health was formed to watch all proposed legislation concerning the public health. Dr. Farquharson is the Chairman, and among the Members are Sir Michael Foster, till recently Professor of Physiology in the University of Cambridge, Sir John Batty Tuke, M.D., formerly President of the Royal College of Physicians of Edinburgh, and Dr. Rutherford Harris, the *fidus Achates* of Cecil Rhodes, who is far more financier than physician. Sir Walter Foster, who takes the jumping cat as his political Mentor, at present holds aloof. A movement has been set on foot for the reconstitution of the Local Government Board, which is the Central authority in our sanitary administration, and for the creation of a special Government Department of Health independent of the Board. A committee of which Lord Jersey is chairman has the whole question under consideration. The opinion of the medical profession was expressed the other day by Sir John Batty Tuke, who said: "I am distinctly in favor of a Ministry of Health, and I would have it possessed of strong powers; and I think we shall see a change for the better in our medical administration before long."

TYPHOID FEVER AND CONTACT.

To the Editor of the MEDICAL NEWS:

SIR: The importance of the subject, coupled with its comparative newness, warrants me in this final demand on your courtesy, in the discussion of the part played by "contact" in the dissemination of typhoid fever. The letter from Prof. Vaughan in your issue of March 19 summarized in a masterly citation the conclusions of the special commission which investigated the spread of typhoid fever during our recent war, and shows conclusively, as he states, that the fever, as it prevailed in the national encampments, was disseminated not to any large extent by drinking water, but chiefly by contact. This is a service for which the profession cannot well be too grateful to Reed, Vaughan and Shakespeare, and which has been quite generally acknowledged, as witness the 1903 edition of Osler's Practice. There are, however, one or two statements in Prof. Vaughan's letter on which I think it incumbent on me to take issue, notwithstanding the fact that he based his remarks chiefly on your editorial and not on my article. The brunt of the matter is borne by the final paragraph of his communication, in which he says: "Now, Mr. Editor, I think I am not too positive when I say that whatever Bretonneau or Trousseau may have thought, or whatever Koch propounded 'more than a year ago,' the fact that typhoid fever is spread largely by contact was first demonstrated by American observers." This, I feel, is hardly fair, either to the earlier French observers or to Koch. The theories of Bretonneau and of Trousseau were not mere haphazard notions or suggestions, but represented the only possible conclusion to be drawn from the study of a very large number of accurately and carefully observed epidemics. In the classical work of Trousseau (*Clinique Médicale de L'Hotel-Dieu de Paris*, 1867) more than five pages are given to the elucidation of this theory, and a large number of epidemics are analyzed from the reports of other observers, with the result that no unprejudiced reader can fail to be convinced of their bearing. Says Trousseau, "An analysis of the reports on the typhoid epidemics in the provinces of France, which are yearly presented to the Academy, demonstrates the contagious nature of typhoid fever definitely for all time." And again, summarizing his conclusions as special commissioner on the epidemics of 1857: "Once started, the disease is propagated by a series of transmissions which are sometimes easy, sometimes impossible, to trace." One must, however, read the entire chapter to appreciate how thoroughgoing and logical were the conclusions of this great school of Bretonneau's. It is then hardly just to say that "the fact that typhoid fever is spread largely by contact was first demonstrated by American observers."

The chief point, however, on which I would differ with Prof. Vaughan is his evident identification of this undoubted fact of contact infection, with the recent theory of Robert Koch. The American commission demonstrated that under certain conditions, namely those maintaining in the national encampments, typhoid fever was spread chiefly by contact. The theory of Koch, however, is so much more comprehensive and far-reaching that it cannot in any way be connected with their work; indeed, it may far more logically be regarded as a true descendant of the tenets of the French school, which held that all epidemics were so propagated. Koch believes (1) that for all *practical purposes* the typhoid bacillus may be regarded as an obligate parasite, which cannot under ordinary circumstances maintain its existence for any length of time in streams or wells. (2) That the vast majority of typhoid infections or epidemics are due to the mediate or immediate transmission of the germs of the disease from the person of one victim to the intestinal tract of the next. The ways in which this may happen were illustrated in my letter. (3) That prophylaxis must be reconstituted on an entirely new basis, with the early identification of the ambulant cases of typhus levissima, and the surveillance of all cases as long as stools or urine (Piorkowski) are infected. I fail to see that the American commission in any way anticipated this "Theory of 'contact infection' in typhoid fever."

Finally, I believe you were justified in pointing out that this theory of "contact infection," as elaborated by Koch, is foreign to Americans, although the fact is well understood that transmission by contact under certain conditions, notably such as maintain in army encampments, does occur. Thus Osler, on page 5 of the Practice, 1903, states: "Infection of water is unquestionably the most common mode of conveyance;" but "the possibility of the direct transmission through the air . . . must be acknowledged." Again, on page 2, he emphasizes the water supply and drainage as the general factors in the dissemination of the disease, and instances the encampment epidemics as special examples of supposed contact infection.

I hope I have made clear the historical relationship of these various contributions to typhoid epidemiology.

Like everyone else, I regard the work of the American commission as a model of exact observation and logical reasoning. But I cannot, nevertheless, depreciate the earlier French work, or the more recent advances made by Koch. Respectfully, R. WEIL.

March 22, 1904.

SOCIETY PROCEEDINGS.

HARVARD MEDICAL SOCIETY OF NEW YORK CITY.

Regular Monthly Meeting, held January 23, 1904.

The President, Frank M. Daniels, M.D., in the Chair.

Some Cases of Genito-urinary Affections, with Involvement of the Kidneys.—The scientific business of the evening was opened by Dr. Eugene Fuller, in a description of some of these affections. He said that undoubtedly the bacteria coli not infrequently find their way through the kidneys into the bladder where they are the source of inflammatory conditions of various kinds. In these cases it is important that the bladder should have thorough drainage. Some of the cases when they almost look hopeless, give brilliant results under thorough drainage of the bladder, but they die very easily of septicemia, and the greatest care must be exercised not only immediately after the operation, but for a considerable period. In a case under his care not long since, the patient had been drinking hard for some time, and while suffering from delirium tremens had also some retention of urine. It was always a struggle for him to get his bladder emptied and there was more or less residual urine, but this led to a very severe attack of cystitis with absorption of septic material.

Backward Infection.—In this case there was so much albumin and casts in the urine, owing to the fact that an upward infection of the kidneys had taken place from the bladder that a very prominent physician had given the patient up as suffering from chronic Bright's disease in a hopeless stage. He had nearly died on several occasions from edema of the larynx and there was little expectation of saving his life. Perineal section was performed, however, and thorough drainage established. Delirium tremens developed after the operation and the patient was encouraged to drink as much as possible of water in order to keep his kidneys thoroughly flushed out and also to get rid of the alcohol accumulated in the system. After a time this case improved so much that a very good prognosis seemed possible. In the course of time the urine became perfectly clear and entirely free from casts and albumin. It seems not improbable to Dr. Fuller that in a certain number of the cases of diagnosed chronic Bright's disease the affection is really primary in the bladder with a secondary infection of the kidneys, and if the kidneys are allowed to do their work properly without further irritation the supposed Bright's disease disappears, or becomes a comparatively unimportant factor in the case. These are the cases of Bright's disease that live for many years notwithstanding the bad prognosis given by their physicians.

Uremic Symptoms Due to Bladder Conditions.—In another case recently under Dr. Fuller's care there were many symptoms of uremia and the fatal termination was looked for as a near event. A stone was found to be present in the bladder, however, and considerable inflammatory reaction. In this case there had evidently been backing up of the urine into the kidneys, for the ureters on operation were found so dilated that the tip of the forefinger could be passed into either one of them. The specific gravity of the urine in this case was from 1.002 to 1.003, and it hardly seemed possible to save the patient. The stone in the bladder was found to have formed in a pouch behind an enlarged prostate. Because of this complication of conditions it was considered necessary to establish drainage, both above the pubis and in the perineum. Immediately after the operation polyuria set in as a critical symptom of the patient's condition. Some writers say that patients who thus suffer from polyuria with a low specific gravity never recover. This patient, however, had a good stomach and could take fluids in large quantities and when he refused to drink, a vein was opened and 1,500 c.c. of normal salt solution were injected. This was repeated several times, but when the refusal to drink continued, a mouth gag was put in, a stomach tube inserted and a quart of water was poured into the stomach. This patient recovered perfectly, though he still requires a physician's care to prevent complications, having to avoid excesses of any kind.

Pseudo-uremia.—In another case of apparent uremia there were many head symptoms pointing to a urinary intoxication. These had been noted for some time. Under drainage of the bladder the patient recovered completely and now has been perfectly well for nearly a year. He still needs careful nursing and regulation of his diet and living conditions or there may be a relapse. Not infrequently these cases are allowed to leave the hospital too soon after operation, with the result that they suffer from complications and sequelæ of their previous uremic condition. In a recent case a doting daughter thought that she could manage her father better than a nurse and so, eight weeks after operation, she was allowed to take the old gentleman home. A few weeks later he died suddenly from pneumonia, probably as the result of too great indulgence on the part of his nurse in allowing him to expose himself in changeable weather.

Careful Nursing.—Dr. Howard Lilienthal said that he agrees with Dr. Fuller that some of these patients suffering from cystitis with secondary kidney conditions are often helped by surgical intervention, even when their pathological conditions were apparently hopeless. With regard to drainage he has come to realize how important this factor may be in making the result of operation on the bladder more successful. In a case exhibiting uremic symptoms with tendency to polyuria, but having cystitis and an enlarged prostate he has removed the prostate and lost the patient, when, if thorough drainage had first been established, a fatal termination would probably not have occurred. He has not always found it necessary to secure drainage by surgical incision into the bladder, but has found that proper preparation for operation can be effectually secured by catheterization of the patient every three hours, day and night, for several days before operation. This gets rid of the bacteriuria and the often more or less pea-soup-like urine of the patient becomes perfectly clear.

Perineal Drainage.—In Dr. Lilienthal's opinion perineal drainage adds an element of danger to the case. The urine is allowed to come in contact with planes of muscles in the perineum which may easily permit infiltration of the surrounding tissues. On the other hand, suprapubic drainage, if carefully accomplished by means of siphonage in the hands of attendants who are familiar with this method of drainage, leaves none of the risks of insidious infiltration of urine that may occur when the perineum is opened.

Dr. Frederic C. Curtis said that in his hands perineal drainage has always seemed to give better results. He believes that many so-called kidney diseases are really not primary nephritis, but secondary infections of the

bladder, due to the backing up of infected urine. These infections are often from the urethra up and not from the kidney down. Perineal drainage is certainly better than trying to retain a catheter constantly in the bladder for purposes of drainage, since this so often proves a source of irritation. Very frequent catheterization in those patients whose bladders are already of very low resistive vitality is apt to set up serious infections of various kinds. The most careful cleansing of the catheter leaves still many bacteria in the urethra to be carried back into the bladder. It must not be forgotten that kidneys have sometimes been extirpated with the idea that they were primary surgical kidneys, when they were really secondary infections.

Suprapubic Drainage.—Dr. Robert H. Green said that in his experience for chronic conditions of the bladder, suprapubic drainage is better than perineal drainage. There has been a tendency to overdo perineal drainage. In tuberculous conditions within the bladder this is especially true. More care must be exercised, however, to keep up suprapubic drainage. The nurses who take care of the patient must be used to this form of treatment so as to be able to keep the skin from getting infected or even irritated, for this forms a favorable nidus for the growth of bacteria and exposes the patient.

Dr. Follen Cabot said that the most important thing with regard to serious bladder and other genito-urinary conditions is careful treatment after operation, carried out over a long period. The route of drainage does not make so much difference as the method of treatment afterward.

Dr. Fuller, in closing the discussion, said that frequent catheterization, with the idea of emptying the bladder of infected urine, will not avail much if the prostatic condition present be serious. For milder cases it does very well and is to be commended. Where there has been retention of urine over a long time it is a useless waste of time to attempt to clear up the urine by means of catheterization.

New Cystoscope.—Dr. Follen Cabot presented a new cystoscope. This has many advantages over previous instruments. For instance, after the ureters have been catheterized, the cystoscope may be withdrawn, leaving the catheters in place for five or six hours, if necessary. If the urethral instrument is allowed to remain for more than a half hour, patients usually become very restless. Some patients become intolerant of it even before this length of time has elapsed. The oval shape of the cystoscopic tube in Dr. Cabot's instrument gives more room for the same size of caliber and is better for a contracted urethra, especially for such contractions as occur near the meatus.

Colon Bacillus in the Kidney.—The paper of the evening on this subject, was read by Dr. Robert H. Green. He said that he did not mean to have any reference to surgical kidney. Twenty years ago it was thought that the knowledge of nephritis was pretty accurate and that its diagnosis could be made from urinary examination. Notwithstanding this, however, uremia followed by sudden death, sometimes occurring without any urinary symptoms. Often, however, small abscesses were found to be present in the kidney in these cases. In recent years it has come to be realized that many bacteria find their way into the urine without injury to the kidneys, and this has been found to be especially true of the *Bacillus coli communis*.

Confusing Methods of Treatment.—A number of methods of treatment for nephritis have been suggested which, far from proving helpful, have tended rather to confuse the practitioner. A number of drugs have been vaunted as good for nephritis or preventive of the occurrence of bacteria in the urine. Decapsulation of the kidney has been advanced as a cure for nephritic conditions. The tearing off of the capsule, however, is likely to do more harm than good, since it exposes patients to the danger of infection from whatever bacteria may be present. Not much dependence can be placed on drugs and even such as widen the caliber of the blood vessels or that increase blood pressure and consequently bring more blood to the kidney can be depended on to do good. In these cases the source of the bacteria that find their way into the urine from the kidney and that sometimes cause kidney symptoms is not always easy to determine, but seems to be due to an ascending affection.

Illustrative Cases.—Dr. Green described as his first patient a man who, on attempting to pass a life insurance examination, was rejected because of the presence of albumin and casts. The rejection was not absolute, but the man was told that he could not be accepted unless his urine could be cleared up. The family history was good, though the man himself had suffered from two attacks of gonorrhea. His urine was found to contain colon bacilli in large quantities in almost pure culture. He refused to allow the use of a cystoscope, so the Harris segregator was employed, but it was found that the bacteria came from both kidneys. On a carefully selected diet, especially with laxative effects from plenteous fruit consumption, his urine cleared up somewhat. In a word, when his digestive disturbances improved his urinary condition was also ameliorated. In the man's history there was an attack of severe dysentery during which it was possible that intestinal walls might have become so affected or so adherent that the outward wandering of colon bacilli became possible. The second case was also an insurance case and was refused because of the presence of albumin, though the man's general health was good, his habits were excellent and he led a very regular life. He denied gonorrhea, yet a number of colon bacilli of the ordinary type could be found in his urine. Under medication his urine cleared up to some extent. Such cases are not very rare in the literature at the present time and for the last decade cases have been reported in which a considerable number of bacteria found their way into the urine without there being any definite lesion of the kidney.

Cases from the Literature.—Not long since Nichols collected about 45 cases of bacteriuria, thirty of which were apparently colon bacilli cases. The presence of colon bacilli is nearly always associated with albumin in the urine, though with no other symptoms of kidney trouble, hence the frequency with which such cases are rejected by life insurance companies. In practically all of these cases the use of antiseptics in the intestinal canal does good. In fact this seems to be the only way by which the conditions can be improved.

Transitional Stage in Kidney Pathology.—Dr. Reynold Webb Wilcox said that this consideration of bacteria and albumin in the urine without kidney involvement can not but be valuable. At the present moment one of the great difficulties of the diagnosis of kidney disease is the recognition of the capacity or incapacity of the organ to do its work. At the present time there is a traditional stage in kidney pathology in which the old idea of chronic inflammation in chronic nephritis is being displaced by the notion of degeneration from autointoxication. Chronic interstitial nephritis is very different from acute interstitial nephritis, hence it has come to be considered better to talk of chronic arterial nephritis. When chronic arterial nephritis is present there is no reason *a priori* why decortication of the kidney should do good. There are

many infections of the kidney that are not taken cognizance of in text-books. It is known now that in 20 per cent. of the cases of typhoid fever, typhoid bacilli are found in the urine. While it remains a question whether bacteria may pass through an absolutely uninjured kidney there seems no doubt that in a certain number of these cases at least, some pathological condition is produced.

Segregation of Urine.—Dr. Follen Cabot said that for the collection of urine from either kidney, in order to determine the presence of kidney disease, the Harris or Down segregators are not reliable. Sources of error may constantly occur, but cannot be foreseen, and that may lead to operative procedures not justified by the condition really present. In using the Harris segregator he once made a serious mistake where the affection present was not one of either kidney, but of the bladder.

Ascending Infection.—Dr. Fuller said that many of these anomalous conditions in the urinary tract do not begin from the kidney and go down, but begin in the bladder and ascend. Even when the colon bacillus is the cause of a pathological condition of the kidney the germ has usually found its way from the colon into the bladder and thence up to the kidney. Good drainage of the bladder therefore is the best possible prophylaxis of further damage to the urinary tract. When women are suffering from uterine troubles it is possible that germs from the interior of the uterus may find their way into the bladder because of certain anomalous or acquired lymphatic connections between the two organs. Experimentally it was shown a few years ago that when germs are injected into tissues surrounding the bladder, they succeed in finding their way into the bladder in a few hours. This is true if the bacteria succeed in getting into the peritoneum at all. It is probable that in many cases of intestinal disease followed by adhesions a passage of germs from the intestine to the bladder is not impossible.

Dr. Spooner said that there is a larger number of these cases of bacteriuria than has formerly been thought. They are often the cases of pseudonephritis in which the discovery of albumin in the urine leads to the diagnosis of Bright's disease, yet, with reasonable care, the patient lives on for many years, without serious derangement of health.

Frequency of Bacteriuria.—Dr. James J. Walsh said that it is very evident now from the literature of the subject that even virulent bacteria may pass through a healthy kidney without producing serious damage to the kidney structure. Even in such mild affections as a felon or in small abscesses staphylococci find their way into the circulation and thence through the kidney into the bladder. Recent reports with regard to typhoid fever seem to show that in about one-half the cases bacteria occur in the urine and continue to be found there sometimes for many weeks or even several months after convalescence has been established. Whenever there have been severe affections of the intestine, especially if these have been followed by adhesions in the neighborhood of the bladder, bacteria find their way through the intestinal and then the bladder walls of the urine.

Kidney Decortication.—Dr. Walsh said that while in theory the stripping of the capsule from the kidney seemed rather to be contraindicated than recommended, a certain number of cases had been reported in which there was no doubt that good had been done. From the cases so far collated it would seem that especially in young persons suffering from the effects of nephritis following scarlet fever or some of the infectious diseases of childhood was improvement likely to take place.

Ubiquity of Colon Bacillus.—Dr. Frank H. Daniels said that the colon bacillus seems to occur in many parts of the human system. They are natural inhabitants of the colon, but scarcely any organ fails to be visited by them. They are very common in the bladder, they are often found in the biliary passages and in the gall-bladder; they have been found in the pancreatic duct and, in Dr. Daniels' own experience, have been known to occur in the mouth. Just how they got there is not easy to say. It impresses the necessity, however, for great care of cleanliness whenever patients are suffering any affection of the intestinal tract.

Dr. Green, in closing the discussion, said that he is not an advocate of the Harris segregator and he used the apparatus only because his patient refused to have his kidneys catheterized by any of the ordinary methods with the cystoscope. He has, however, often found the use of the urinary segregator of great importance and one of its decided advantages is that it causes no pain. After all, many sensitive individuals are utterly unable to bear the discomfort of having a catheter inserted and then allowed to remain for some time and not infrequently the use of the urinary segregator is sufficient for the diagnostic purposes intended. In the cases under discussion those of bacteriuria, it is not often necessary to secure urine from the separate kidneys, as the affection causing the presence of the bacteria extends to both sides of the urinary tract as a rule, or else is confined to the bladder itself.

Officers.—The election of officers for the ensuing year then took place. Dr. Augustus S. Knight being elected President; Dr. J. Hilton Waterman was re-elected Secretary, and Dr. Joseph H. Kenefick was re-elected Treasurer.

JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

Stated Meeting, held March 7, 1904.

Arthritis Deformans.—Dr. McCrae exhibited three medical cases. The first was a patient showing the early acute stage of arthritis deformans which in the Johns Hopkins Hospital is thought, in all probability, to be an infectious disease—its late manifestations being too often considered, and its early non-degenerative form being overlooked. Patient was a man of twenty-one years, in perfect health and with good previous history. In December, 1903, he had first noticed creaking and slight pain in the knee. There was also some pain and disability in the other knee, the ankles, the shoulder and the fingers. General health was excellent and most of the joints cleared up leaving behind a somewhat thickened capsule, slight creaking and a little restriction of motion. At present the right knee is the only joint much involved showing fulness, creaking and a thickening of the capsule. The ankle and shoulder, however, are somewhat affected. There is general glandular enlargement, with enlargement of the spleen, increase in the reflexes, normal blood count and no temperature. X-ray picture shows no bone changes. The condition was thought to be probably infectious or at least the result of an infection and probably identical with the disease described by Still. The cases of arthritis deformans studied in the Johns Hopkins Hospital form a complete series according to the age of the patients. In the young cases the glands and spleen are often enlarged and in these patients a diagnosis of Still's disease is made. With increase in age glandular enlargement becomes less marked and we gradually approach the typical arthritis deformans of adults. The disease is, however, the same condition throughout, its manifestations being somewhat altered by the age of the patient. The prognosis of these cases varies. Some of the pa-

tients get entirely well, but in others the disease is recurrent and in many becomes chronic. Two theories as to the nature of arthritis deformans have been advanced, one regarding it as a specific infection and the other as a joint involvement following other varied infections (gonorrhea, influenza, etc.). Certainly in these patients the joint troubles are stirred up by subsequent infections. The question of the local treatment of the joint involved is a most important one, and the value of a good functioning knee joint makes it doubly important in cases where that joint is involved. Arthrotomy and irrigation seem wise procedures and if a villous arthritis is found, the superabundant tissue can be removed surgically. The important point to remember in connection with this case Dr. McCrae thought to be the fact that the acute stage is so often either overlooked or confused with rheumatism.

Tumor of the Parotid Gland.—Dr. Cole showed this case. There was a distinct luetic history, and five years previously tuberculous glands had been removed from both sides of the neck. A pleurisy eight weeks before admission and a few crackling râles pointed to possible tuberculous condition in the chest. In the parotid region there was a fluctuating superficial swelling which had first appeared without pain six weeks ago. A dram of pus was withdrawn, but no tubercle bacilli were found and cultures were negative. The history of tuberculosis, however, and the clinical characters of the swelling pointed to its probable tuberculous character, though the guinea pig injection had not positively decided the question. Tuberculosis of the parotid is a very rare condition. Certain organs in the body seem to be immune to this infection, the salivary glands being very rarely affected in spite of the fact that the lymph glands are so often involved.

Eosinophiles During Experimental Trichinous Infection.—Dr. Opie read this paper. The eosinophiles were known long before Ehrlich, but the granules were thought to be fat. They occur in all mammals and are always less in number than the neutrophilic cells. The ordinary leucocytosis is well understood, but eosinophilic leucocytosis has never been well worked out. Dr. Opie infected guinea pigs with trichinous meat and found that the eosinophiles showed no change until the tenth or twelfth day and then gradually increased till the twenty-first day. The polynuclears also increased for a time. When a great number of trichinæ were used the weight of the animal fell. Just before death there is a rapid decrease in the eosinophiles. The question of the relation between the blood cells and the course of the embryos in the body is an interesting one. In the mucosa of the intestines there is no definite increase in the eosinophiles, nor is there an accumulation anywhere else except in the lymph glands and in the lungs. In the bone-marrow of animals dead of this disease the fat is found much diminished and the narrow cells increased. This is particularly true of the eosinophiles and the increase affects chiefly the myelocytes. This corresponds to the "leucoblastic marrow" seen in human beings. When the trichinous infection is large, destruction of the eosinophiles is seen and the effects of this parasite, as seen in Dr. Opie's experiments, suggests the work of some soluble toxine.

Chemical Origin of the Leucocyte in Leucemia.—Dr. Schmoll reported his investigations on this subject. The blood was studied with the patient on various diets and it was found that food rich in albumin increases the number of leucocytes, the kind of albumin being apparently indifferent. The conclusion was drawn that the body is capable of extracting nuclein from the ingested food and that the increase of phosphorus is an important factor.

MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND.

Section on Clinical Medicine.

Stated Meeting, held March 4, 1904.

Tracheal Tumors.—Dr. Rosenheim read this paper, reporting a case which had occurred in the surgical wards of the Johns Hopkins Hospital. The condition is a rare one, of 3,120 tumors reported in the upper respiratory tract only 7 occurring in the trachea. This lack of susceptibility of the trachea to new growths is probably due to its functional passivity. Dr. Rosenheim's patient was a woman aged twenty-three years who complained of difficulty in breathing. Nine months before admission she first noticed a heavy, choking sensation in the air passages, and cough, dyspnea and slight expectoration soon appeared. Cough without expectoration was present on admission, no glands were palpable and heart and lungs were negative. Laryngoscopic examination showed normal larynx and vocal cords; but just below the cords was a small, red, smooth tumor which did not move with respiration or phonation. Operation was done by Dr. Halsted. A preliminary tracheotomy being the first step in the procedure. The tumor was found opposite the cricoid cartilage and the upper tracheal rings. The patient stopped breathing during the operation but anal dilatation was successful in stimulating respiration. Recovery was uneventful and the patient was perfectly well six months later. The tumor was capsulated, contained mucoid fluid; on section it showed trabeculæ with colloid in the intertrabecular spaces. Pathologically the diagnosis was colloid fibroadenoma.

Tracheal tumors are clinically all alike. They were first seen laryngoscopically by Turck. Of the benign neoplasms all types occur—papillomata, fibromata and chondromata being the most frequent. Carcinoma and sarcoma are the types of malignancy most often met with. On the posterior wall of the upper and lower portions of the trachea tumors are most frequently seen. Of the infectious granulomata lues is the most frequent form; but tuberculous tumors are also sometimes seen. Another type of tumor in this region consists of the proliferations which occasionally occur after tracheotomies. Thyroid tumors are not unusual, are seen most often in women and consist of typical glandular tissue. Bruns and others hold that they represent merely an embryonic misplacement; but Ziemssen claims that they are due to thyroid proliferation and actual in growth involving the trachea. The symptoms of tracheal tumor only occur when stenosis is present. Dyspnea is first to appear. Then comes enfeebling of the voice with hoarseness. Lung changes (bronchiectasis, bronchitis, atelectasis) may occur. The diagnosis is positively made by laryngoscopic or tracheoscopic examination; but, excluding esophageal and thyroid tumor, a husky voice is most suspicious, provided there be no aortic aneurism. The nature of the tumor is practically impossible to be sure about. Prognosis is, without operation, most unfavorable. The tumor may be removed by laryngotracheotomy or by endotracheotomy.

Hysterical Paralysis in Men.—Dr. Thomas reported two cases of this affection. Hysteria, on account of its frequency in women, is easily overlooked in the opposite sex; but it does occur and with some frequency. The first patient was a farmer and banker, who had led a more or less sedentary life since his eighteenth year. He had always been bothered by constipation with occasional attacks of abdominal pain and vomiting, which he attributed to nervous dyspepsia. For this he was treated at the Johns Hopkins Hospital and was discharged well. He was in the next few months somewhat overworked and suffered three severe nervous

attacks. A little later he was taken with pain in the left side, diagnosed pleurisy. He became well from this attack, but his body was afterward drawn over to the left side. Soon after an area of numbness appeared in the left hip, the left leg began to drag, and a fourth nervous attack supervened. Patient was admitted with pain in the left side, subjective numbness, paralysis of left leg below the knee. On the inside of dorsum of foot there was an area where touch and pain sensations were diminished (pressure on the sciatic nerve was thought of, but the anesthesia was on the wrong side of the foot). Reflexes were normal, and the foot was held up when electricity was applied and the current shut off without the patient's knowledge. He walked dragging his toe. Treatment was electrical and psychical, and the patient soon got perfectly well. The second case was a young man of twenty years, who, while romping one evening, received a slight injury to his arm with a good deal of shock. A large amount of whisky was given to treat the shock; and the following day there was great pain in the right arm, absolute paralysis appearing twenty-four hours later. An injury to the brachial plexus was of course diagnosed. When first seen by Dr. Thomas, patient showed absolute powerlessness of the arm with complete anesthesia to pain, touch and temperature extending to the wrist where it ended sharply. Muscular sense was wanting in the same area. Paralysis affected the shoulder and arm, but there was slight movement of the fingers. Reflexes and electrical reactions were normal, which, together with the distribution of paralysis and anesthesia, placed organic disease out of the question. Electrical treatment was given. On the second day recovery had occurred as far as the elbow, and on the fourth day patient was perfectly well. In connection with these cases Dr. Thomas referred to the suggestion of one of the European observers that the hysterical stigmata may be due to suggestion, and emphasized the importance of avoiding questions which may give the patient a clue as to what symptoms he *ought* to present.

Dr. Hirschberg said that he had recently seen a case of hysterical mutism in a young man of eighteen years, who had recovered completely in three weeks.

BOOK REVIEWS.

ORGANIC AND PHYSIOLOGIC CHEMISTRY. A Manual for Students and Practitioners. By Dr. A. McGLANNAN, Associate Professor of Physiological Chemistry; Instructor in Clinical Laboratory, College of Physicians and Surgeons, Baltimore. Lea Brothers & Co., New York and Philadelphia.

THIS is a recent member of the medical Epitome Series of the house of Lea Brothers, and is a most excellent and handy volume. For the beginner such epitomes are often very useful and this is one of the best of the class. It is also serviceable for the old-time graduate who is not quite sure of the differences between a paraffin and an olefine, a fatty acid or an aldehyde. He can find here a short, succinct summary of the principles of organic and physiological chemistry.

BACTERIOLOGY OF MILK. By HAROLD SWITHINBANK, of the Bacteriological Research Laboratory, Denham; and GEORGE NEWMAN, M.D., F.R.S.E., D.P.H., Medical Officer of Health of the Metropolitan Borough of Finsbury. E. P. Dutton & Co., New York.

WERE one only partly en rapport with the immense importance of the subject of the bacterial flora of milk the suspicion would be engendered that this volume of 604 pages, and encyclopedic in proportions, is not justified; but to the health officer, the practitioner who sees sick children, and those who come in contact with dairy interests, will give a leap of anticipation, that finally this subject, of paramount importance, has been adequately presented.

The hope they will find, we believe, to be fulfilled. The volume is one of the best types of a sanitary exposition of the whole subject of the relation that bacteria bear to milk and the dairy, not to speak of the important consideration given to the problems of milk infections in human pathology.

We welcome this volume, and trust that an appreciative public will render work of this character profitable to both publishers and authors alike. It is largely by such support that our best gifts in medical sanitation have been given, and it is a duty as well as a privilege to encourage the production of work of this enduring and practical type—moreover profit is ample to the purchaser who reads.

GENERAL PATHOLOGY. By ERNST ZIEGLER. Translated from the Tenth Revised German Edition and edited by ALFRED SCOTT WARTHIN, Ph.D., M.D., Professor of Pathology and Director of the Pathological Laboratory in the University of Michigan, Ann Arbor, Michigan. William Wood & Company, New York.

WERE it not for the fact that the merits of Ziegler's pathology were so well known to the medical public of this country, we would be inclined to rhapsodize concerning its excellence of form, and generalize upon the philosophical grasp of the subject of pathology, as shown by the author. The subject warrants eulogy, and is deserving of special attention, for, in the new edition, Ziegler is not only translated but interpreted and that means much for the type of work before us. At least eleven editions of Ziegler have come from the Fischer Verlag, and this is, if the reviewer remembers aright, the third English presentation.

We are firmly of the opinion that this type of work should be in every student's laboratory, and every progressive physician's library. Details may change, but the large outlines of pathology, as drawn by Ziegler, will not be materially modified for some time, and the wealth of bibliography will render such a work one of invaluable aid. The publishers have done their part in aiding Dr. Warthin's interpretation.

BOOKS RECEIVED.

The MEDICAL NEWS *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* MEDICAL NEWS *will shortly appear.*

INFANT FEEDING IN ITS RELATION TO HEALTH AND DISEASE. By Dr. Louis Fischer. Third edition. 8vo, 358 pages. F. A. Davis Co., Philadelphia.

CLINICAL LECTURES ON THE NERVOUS SYSTEM. By Sir Wm. Gowers. Second series. 8vo, 250 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.

THE TREATMENT OF FRACTURES. By Dr. C. L. Scudder. Fourth edition. 8vo, 534 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

MODERN SURGERY, GENERAL AND OPERATIVE. By Dr. J. C. DaCosta. Fourth edition. 8vo, 1,099 pages. Illustrated. W. B. Saunders & Co., New York, Philadelphia and London.

A LABORATORY MANUAL OF PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY. By Dr. E. Salkowsky. Translated by Dr. W. R. Orndorff. 8vo, 263 pages. Illustrated. John Wiley & Sons, New York.